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# UK METEOROLOGICAL OFFICE
# GLOBAL DATA MONITORING REPORT

## FEBRUARY 2000

**Data Assimilation**
**Meteorological Office**
**London Rd**
**Bracknell**
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**RG12 2SZ**

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## 1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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## 2 Global Data Monitoring Statistics

### Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

### Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

### Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m $s^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m $s^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

| Figure | Parameter |
|---|---|
| 4 | Mean wind vectors |
| 5 | Mean observation - background wind vector |
| 6 | Mean observation-background speed (m $s^{-1}$) |
| 7 | RMS observation-background vector (m $s^{-1}$) |

## Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

## Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

| Figure | Parameter Plotted | Layer (hPa) |
|---|---|---|
| 10 | Availability/average daily number | 701-1000 |
| 11 | Vector mean wind (observed) | 701-1000 |
| 12 | Observation-background vector wind difference | 701-1000 |
| 13 | Mean observation-background speed differences | 701-1000 |
| 14 | RMS observation-background vector difference | 701-1000 |
| 15 | Availability/average daily number | 401-700 |
| 16 | Vector mean wind (observed) | 401-700 |
| 17 | Observation-background vector wind difference | 401-700 |
| 18 | Mean observation-background speed differences | 401-700 |
| 19 | RMS observation-background vector difference | 401-700 |
| 20 | Availability/average daily number | 101-400 |
| 21 | Vector mean wind (observed) | 101-400 |
| 22 | Observation-background vector wind difference | 101-400 |
| 23 | Mean observation-background speed differences | 101-400 |
| 24 | RMS observation-background vector difference | 101-400 |

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

| Figure | | Weighting function peak (hPa) |
|---|---|---|
| 26 | Mean | Surface (HIRS8) |
| 27 | SD | Surface (HIRS8) |
| 28 | Mean | 700 (HIRS15) |
| 29 | SD | 700 (HIRS15) |
| 30 | Mean | 500-700 (HIRS11) |
| 31 | SD | 500-700 (HIRS11) |
| 32 | Mean | 400 (HIRS4) |
| 33 | SD | 400 (HIRS4) |
| 34 | Mean | 700 (AMSUA5) |
| 35 | SD | 700 (AMSUA5) |
| 36 | Mean | 300 (AMSUA7) |
| 37 | SD | 300 (AMSUA7) |
| 38 | Mean | 100 (AMSUA9) |
| 39 | RMS | 100 (AMSUA9) |

## 3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

## Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.

## TABLE 1

## MONITORING OF MARINE SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

### Monitoring procedures

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for ships, fixed buoys and platforms.

**Standard of comparison** :Background field from UKMO global model.

**Observation times** :00, 06, 12, 18 UTC

**Elements monitored** :Mean sea level pressure (hPa).
:Wind speed (m s$^{-1}$).
:Wind direction (Degrees).

**Parameters monitored**

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
**N.B. a positive bias indicates the observation is veered to the background.**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

**GROSS ERROR LIMIT** :15 hPa (pressure)
:25 m s$^{-1}$ (vector wind)

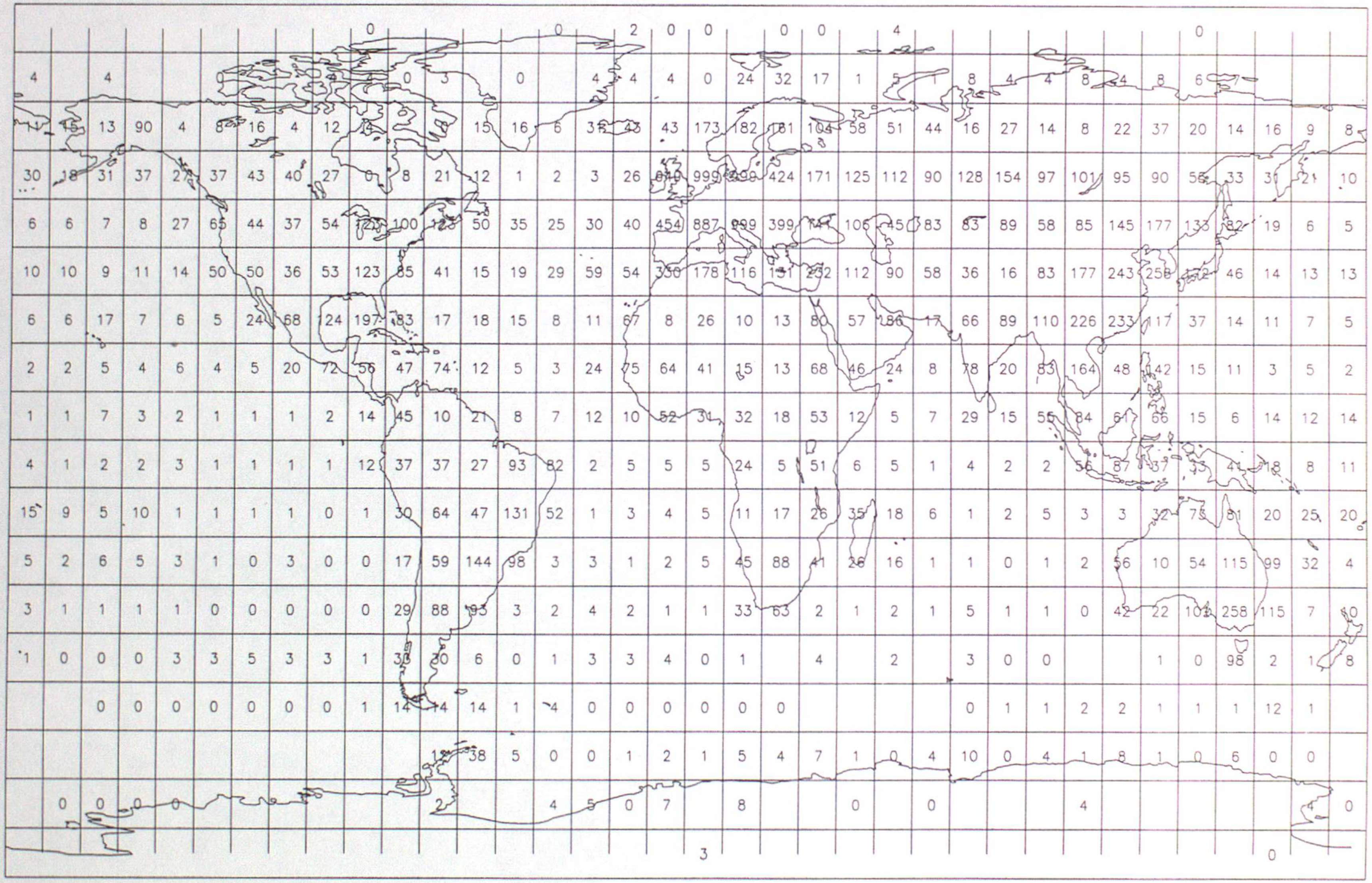
**SELECTION CRITERIA** :NOBS ≥ 20 , and one or more of the following:

| | | |
|---|---|---|
| 1.\|bias\| | ≥ 4 hPa | (pressure), |
| | ≥ 5 m s$^{-1}$ | (wind speed), |
| | ≥ 30 degrees | (direction). |
| 2.SD | ≥ 6 hPa | (pressure), |
| | ≥ 80 degrees | (direction). |
| 3.PGE | ≥ 25 | |

**N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s$^{-1}$**

| IDENTIFIER | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | |
| C6FI9 | ALL | P | SUR | 21 | 2 | 10 | 2.7 | 5.7 | 6.3 |
| DGAF | ALL | P | SUR | 38 | 0 | 0 | 1.0 | -5.5 | 5.6 |
| ELMQ | ALL | P | SUR | 22 | 4 | 18 | 4.4 | -5.6 | 7.1 |
| ELUB5 | ALL | P | SUR | 24 | 0 | 0 | 1.4 | 9.3 | 9.4 |
| ELUQ3 | ALL | P | SUR | 26 | 6 | 23 | 5.4 | -9.0 | 10.5 |
| ELVI2 | ALL | P | SUR | 84 | 1 | 1 | 1.2 | -5.4 | 5.6 |
| ELVJ9 | ALL | P | SUR | 37 | 0 | 0 | 1.3 | -4.5 | 4.6 |
| ELWR3 | ALL | P | SUR | 70 | 18 | 26 | 5.7 | -3.8 | 6.9 |
| LAFQ5 | ALL | P | SUR | 24 | 0 | 0 | 1.1 | -5.8 | 5.9 |
| MQVN5 | ALL | P | SUR | 71 | 0 | 0 | 2.1 | 4.7 | 5.1 |
| PCCQ | ALL | P | SUR | 58 | 0 | 0 | 1.1 | -6.4 | 6.5 |
| P3GB4 | ALL | P | SUR | 56 | 0 | 0 | 1.9 | 6.1 | 6.4 |
| UBAW | ALL | P | SUR | 25 | 19 | 76 | 7.3 | -5.2 | 8.9 |
| UCAD | ALL | P | SUR | 34 | 0 | 0 | 0.9 | -5.8 | 5.9 |
| UFNO | ALL | P | SUR | 24 | 0 | 0 | 1.5 | 6.3 | 6.5 |
| WDZB | ALL | P | SUR | 23 | 0 | 0 | 1.1 | -6.0 | 6.1 |
| 3FDY6 | ALL | P | SUR | 20 | 8 | 40 | 4.7 | -4.4 | 6.4 |
| 52046 | ALL | P | SUR | 156 | 0 | 0 | 5.0 | -5.0 | 7.0 |
| 62165 | ALL | P | SUR | 40 | 11 | 27 | 0.9 | 0.2 | 1.0 |
| 62405 | ALL | P | SUR | 37 | 14 | 38 | 6.8 | -3.0 | 7.4 |
| WIND DIRECTION | | | | | | | | | |
| C6JE5 | ALL | SPEED | SUR | 47 | 0 | 0 | 2.5 | -7.3 | 7.7 |
| C6NI3 | ALL | SPEED | SUR | 39 | 0 | 0 | 6.6 | 8.8 | 11.0 |
| DADD | ALL | SPEED | SUR | 28 | 0 | 0 | 4.1 | 6.8 | 8.0 |
| ELJJ5 | ALL | SPEED | SUR | 39 | 0 | 0 | 5.5 | 7.6 | 9.4 |
| ELSX6 | ALL | SPEED | SUR | 23 | 0 | 0 | 5.5 | 6.2 | 8.3 |
| ELTM7 | ALL | SPEED | SUR | 21 | 0 | 0 | 2.0 | 5.1 | 5.5 |
| ELTX9 | ALL | SPEED | SUR | 42 | 0 | 0 | 6.3 | 6.8 | 9.3 |
| ELWC6 | ALL | SPEED | SUR | 50 | 0 | 0 | 7.2 | 10.4 | 12.6 |
| ELXK6 | ALL | SPEED | SUR | 34 | 0 | 0 | 3.4 | 12.2 | 12.7 |
| GLNE | ALL | SPEED | SUR | 55 | 0 | 0 | 4.0 | 5.6 | 6.9 |
| LAQT2 | ALL | SPEED | SUR | 63 | 0 | 0 | 4.1 | 5.7 | 7.1 |
| P3FV6 | ALL | SPEED | SUR | 24 | 0 | 0 | 2.6 | 5.2 | 5.8 |
| P3GB4 | ALL | SPEED | SUR | 55 | 0 | 0 | 2.6 | 5.2 | 5.8 |
| P3ZY6 | ALL | SPEED | SUR | 46 | 0 | 0 | 6.2 | 6.8 | 9.2 |
| SKWI | ALL | SPEED | SUR | 21 | 0 | 0 | 2.7 | 5.0 | 5.7 |
| UCUP | ALL | SPEED | SUR | 23 | 0 | 0 | 2.4 | 5.4 | 5.9 |
| VCTJ | ALL | SPEED | SUR | 31 | 0 | 0 | 4.0 | 5.7 | 7.0 |
| VNGK | ALL | SPEED | SUR | 21 | 0 | 0 | 4.5 | 9.5 | 10.5 |
| VRVZ4 | ALL | SPEED | SUR | 25 | 0 | 0 | 2.2 | 6.6 | 7.0 |
| YJYY2 | ALL | SPEED | SUR | 41 | 0 | 0 | 6.3 | 5.9 | 8.6 |
| ZCBL4 | ALL | SPEED | SUR | 54 | 0 | 0 | 2.8 | 5.7 | 6.4 |
| ZCBS6 | ALL | SPEED | SUR | 21 | 0 | 0 | 6.5 | 8.0 | 10.3 |
| 3FSL4 | ALL | SPEED | SUR | 23 | 0 | 0 | 2.5 | 7.3 | 7.7 |
| 64046 | ALL | SPEED | SUR | 565 | 0 | 0 | 4.9 | -6.3 | 8.0 |
| WIND DIRECTION | | | | | | | | | |
| DEDI | ALL | DIRN. | SUR | 151 | 0 | 0 | 120.3 | 32.9 | 124.7 |
| ELWT7 | ALL | DIRN. | SUR | 315 | 0 | 0 | 69.2 | 33.0 | 76.7 |
| 3FFR6 | ALL | DIRN. | SUR | 21 | 0 | 0 | 56.9 | -54.7 | 78.9 |
| 46023 | ALL | DIRN. | SUR | 91 | 0 | 0 | 31.5 | -35.4 | 47.4 |
| 62120 | ALL | DIRN. | SUR | 193 | 0 | 0 | 11.7 | -53.0 | 54.3 |
| 62144 | ALL | DIRN. | SUR | 230 | 0 | 0 | 24.0 | 52.7 | 57.9 |
| 63104 | ALL | DIRN. | SUR | 131 | 0 | 0 | 37.4 | 53.4 | 65.1 |

AVAILABILITY – SHIP/SYNOP – FEBRUARY 2000 FIGURE 1
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 22460



# TABLE 2

## MONITORING OF MARINE SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - DRIFTING BUOYS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for drifting buoys. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 06, 12, 18 UTC |
| **Elements monitored** | | :Mean sea level pressure (hPa).<br>:Wind speed (m $s^{-1}$).<br>:Wind direction (degrees). |
| **Parameters monitored** | | |
| | :NOBS | :Number of observations received excluding duplicates. |
| | :NGE | :Number of observations with gross errors. |
| | :PGE | :Percentage of observations with gross errors. |
| | :SD | :SD of difference of observations from background values excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors.<br>**N.B. a positive bias indicates the observation is veered to the background.** |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors. |
| **GROSS ERROR LIMIT** | :15 hPa<br>:25 m $s^{-1}$ | (pressure)<br>(vector wind) |

| | | | |
|---|---|---|---|
| **SELECTION CRITERIA :** | NOBS | ≥ 20 , and one or more of the following: | |
| | 1.\|bias\| | ≥ 4 hPa | (pressure), |
| | | ≥ 5 m $s^{-1}$ | (wind speed), |
| | | ≥ 30 degrees | (direction). |
| | 2.SD | ≥ 6 hPa | (pressure), |
| | | ≥ 80 degrees | (direction). |
| | 3.PGE | ≥ 25. | |

**N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m $s^{-1}$**

| IDENTIFIER | LAT. | LONG. | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | | | |
| 14917 | -31.0 | 32.4 | ALL | P | SUR | 27 | 7 | 26 | 2.7 | -9.3 | 9.7 |
| 21902 | 56.4 | -165.9 | ALL | P | SUR | 158 | 12 | 8 | 5.7 | -7.1 | 9.1 |
| 22901 | 75.7 | -96.8 | ALL | P | SUR | 203 | 10 | 5 | 7.0 | -0.5 | 7.1 |
| 22902 | 79.7 | -97.3 | ALL | P | SUR | 151 | 151 | 100 | | | |
| 22906 | 39.1 | 133.1 | ALL | P | SUR | 98 | 0 | 0 | 2.6 | 4.4 | 5.1 |
| 25565 | 42.3 | -83.7 | ALL | P | SUR | 26 | 26 | 100 | | | |
| 31953 | -20.8 | -40.7 | ALL | P | SUR | 586 | 65 | 11 | 2.6 | 8.3 | 8.7 |
| 44657 | 47.7 | -61.3 | ALL | P | SUR | 154 | 146 | 95 | 9.4 | -3.1 | 9.9 |
| 44766 | 54.9 | -8.3 | ALL | P | SUR | 237 | 1 | 0 | 1.9 | -7.3 | 7.5 |
| 46509 | -48.3 | -22.4 | ALL | P | SUR | 97 | 90 | 93 | 1.5 | -1.1 | 1.8 |
| 46930 | 25.2 | -150.8 | ALL | P | SUR | 171 | 171 | 100 | | | |
| 48575 | 76.9 | -162.2 | ALL | P | SUR | 269 | 95 | 35 | 8.1 | -5.7 | 9.9 |
| 61534 | 34.9 | 28.2 | ALL | P | SUR | 466 | 54 | 12 | 2.0 | 11.4 | 11.6 |
| 64546 | 64.1 | -21.9 | ALL | P | SUR | 350 | 5 | 1 | 2.5 | -6.6 | 7.1 |
| 65594 | 62.5 | -39.6 | ALL | P | SUR | 324 | 223 | 69 | 4.3 | 8.9 | 9.9 |
| WIND DIRECTION | | | | | | | | | | | |
| 21906 | 39.2 | 135.9 | ALL | DIRN. | SUR | 190 | 0 | 0 | 87.1 | -0.9 | 87.1 |
| 22905 | 38.5 | 129.7 | ALL | DIRN. | SUR | 59 | 0 | 0 | 21.0 | 40.8 | 45.9 |

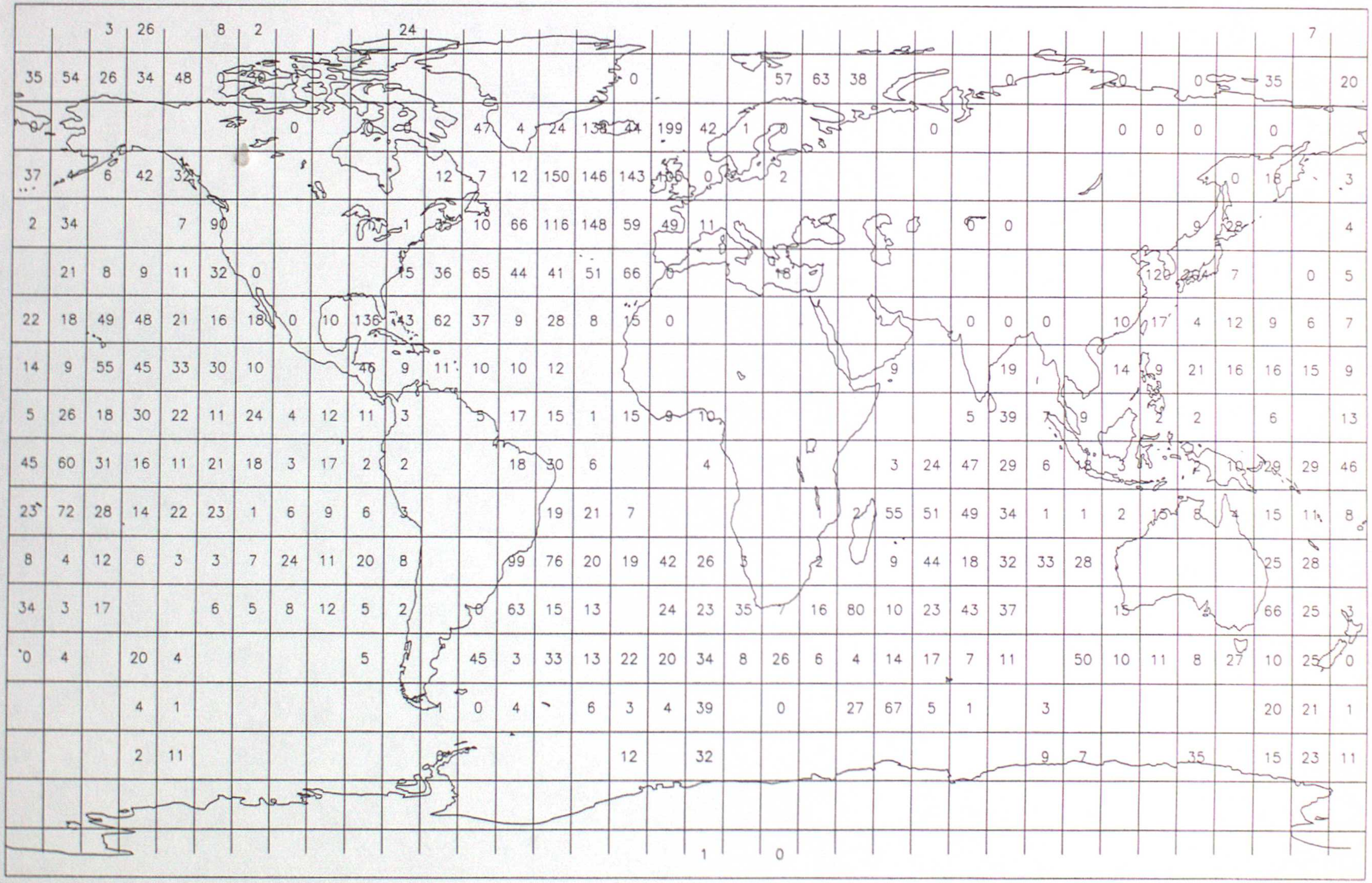
AVAILABILITY – DRIFTER – FEBRUARY 2000

FIGURE 2

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 7548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2 34 7 90 1 35 10 66 116 148 59 49 11 0 0 9 28 4
21 8 9 11 32 0 15 36 65 44 41 51 66 0 18 120 23 7 0 5
22 18 49 48 21 16 18 0 10 136 43 62 37 9 28 8 15 0 0 0 0 10 17 4 12 9 6 7
14 9 55 45 33 30 10 46 9 11 10 10 12 9 19 14 9 21 16 16 15 9
5 26 18 30 22 11 24 4 12 11 3 5 17 15 1 15 9 10 5 39 7 9 2 2 6 13
45 60 31 16 11 21 18 3 17 2 2 18 30 6 4 3 24 47 29 6 18 3 2 10 29 29 46
23 72 28 14 22 23 1 6 9 6 3 19 21 7 1 2 55 51 49 34 1 1 2 15 8 4 15 11 8
8 4 12 6 3 3 7 24 11 20 8 99 76 20 19 42 26 3 2 9 44 18 32 33 28 3 25 28
34 3 17 6 5 8 12 5 2 0 63 15 13 24 23 35 7 16 80 10 23 43 37 15 3 66 25 3
0 4 20 4 5 45 3 33 13 22 20 34 8 26 6 4 14 17 7 11 50 10 11 8 27 10 25 0
4 1 1 0 4 6 3 4 39 0 27 67 5 1 3 20 21 1
2 11 12 32 9 7 35 15 23 11
1 0

# TABLE 3

## MONITORING OF LAND SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for synops & autosynops. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00, 06, 12, 18 UTC |
| **Elements monitored** | | :Surface pressure (hPa). |
| **Parameters monitored** | :HT(m) | :Station height (in metres) as given in WMO No. 9 Vol A |
| | :RP | :Pressure reporting practice<br>M=mean sea level pressure (hPa) reported.<br>S=Station level pressure reported.<br>8=Geopotential height (m) of 850 hPa surface reported.<br>7=Geopotential height (m) of 700 hPa surface reported. |
| | :NOBS | :Number of observations received excluding duplicates. |
| | :NGE | :Number of observations with gross errors. |
| | :PGE | :Percentage of observations with gross errors. |
| | :%REJ | :Percentage of observations flagged excluding those with gross errors. |
| | :SD | :SD of difference of observations from background values excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors. |
| **GROSS ERROR LIMIT** | :15 hPa | (pressure) |
| **SELECTION CRITERIA** | :NOBS | ≥ 20 ,and one or more of the following: |
| | 1.\|bias\| | ≥ 4 hPa |
| | 2. SD | ≥ 6 hPa |
| | 3.PGE | ≥ 25. |

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 60445 | 36.2N | 5.4E | 1081 | S8 | 108 | 1 | 1 | 1 | 0.8 | 5.3 | 5.4 |
| 60468 | 35.6N | 6.2E | 1052 | S8 | 109 | 109 | 100 | 0 | | | |
| 60511 | 35.3N | 1.4E | 1127 | S8 | 108 | 104 | 96 | 0 | 0.2 | 14.7 | 14.7 |
| 60535 | 34.7N | 3.3E | 1144 | S8 | 80 | 0 | 0 | 0 | 0.7 | -5.8 | 5.8 |
| 60670 | 24.6N | 9.5E | 1054 | S8 | 104 | 0 | 0 | 1 | 1.0 | 9.9 | 10.0 |
| 62790 | 12.1N | 24.9E | 674 | MS | 61 | 4 | 7 | 7 | 2.9 | 4.1 | 5.0 |
| 63330 | 13.5N | 39.5E | 2070 | MS | 42 | 41 | 98 | 0 | 0.0 | -14.8 | 14.8 |
| 63333 | 11.1N | 39.7E | 1903 | MS | 70 | 0 | 0 | 0 | 0.7 | 5.6 | 5.6 |
| 63334 | 10.3N | 37.7E | 2515 | MS | 68 | 0 | 0 | 0 | 1.1 | 10.8 | 10.9 |
| 63402 | 7.7N | 36.8E | 1725 | MS | 49 | 1 | 2 | 0 | 0.9 | 7.4 | 7.5 |
| 63450 | 9.0N | 38.8E | 2354 | MS | 92 | 1 | 1 | 0 | 0.8 | 4.9 | 5.0 |
| 63471 | 9.6N | 41.9E | 1260 | MS | 91 | 0 | 0 | 0 | 0.8 | 11.3 | 11.3 |
| 63478 | 5.9N | 43.6E | 295 | MS | 63 | 0 | 0 | 0 | 1.0 | 6.1 | 6.2 |
| 63602 | 3.1N | 30.9E | 1204 | S | 52 | 51 | 98 | 0 | 0.0 | 13.1 | 13.1 |
| 63680 | 0.3N | 32.6E | 1144 | S | 36 | 0 | 0 | 42 | 1.1 | -8.0 | 8.1 |
| 68030 | 18.5S | 25.6E | 1071 | 8 | 29 | 0 | 0 | 0 | 0.9 | 4.2 | 4.3 |
| 68106 | 23.6S | 15.1E | 407 | S | 68 | 17 | 25 | 0 | 0.8 | 0.5 | 0.9 |
| 68338 | 26.9S | 24.6E | 1234 | S | 45 | 36 | 80 | 0 | 1.0 | 0.1 | 1.0 |
| 68396 | 26.5S | 31.3E | 641 | S8 | 25 | 0 | 0 | 0 | 0.7 | 5.2 | 5.2 |
| 68546 | 30.8S | 26.9E | 1347 | S8 | 76 | 38 | 50 | 1 | 0.8 | 0.7 | 1.1 |

WMO REGION 2:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 24671 | 63.9N | 135.9E | 402 | MS | 113 | 1 | 1 | 0 | 4.1 | 6.0 | 7.3 |
| 24688 | 63.3N | 143.2E | 741 | MS | 113 | 15 | 13 | 0 | 4.7 | 5.8 | 7.5 |
| 30320 | 56.9N | 105.7E | 669 | MS | 84 | 43 | 51 | 0 | 1.5 | 2.8 | 3.2 |
| 30664 | 53.5N | 115.6E | 811 | MS | 28 | 0 | 0 | 0 | 1.0 | -4.3 | 4.4 |
| 30669 | 53.1N | 117.5E | 708 | MS | 24 | 0 | 0 | 0 | 1.6 | -5.4 | 5.6 |
| 30967 | 49.9N | 115.8E | 623 | MS | 84 | 0 | 0 | 0 | 2.0 | -5.7 | 6.0 |
| 31123 | 57.8N | 130.9E | 255 | MS | 59 | 2 | 3 | 17 | 1.7 | 4.2 | 4.5 |
| 40701 | 39.3N | 44.4E | 1470 | MS | 55 | 1 | 2 | 2 | 1.0 | 8.3 | 8.4 |
| 40738 | 36.8N | 54.5E | 155 | MS | 55 | 45 | 82 | 36 | 0.4 | 14.3 | 14.3 |
| 40741 | 36.6N | 61.2E | 235 | M | 53 | 0 | 0 | 55 | 1.6 | -4.9 | 5.2 |
| 40743 | 36.2N | 57.7E | 941 | MS | 94 | 0 | 0 | 0 | 1.0 | -4.6 | 4.7 |
| 40762 | 35.3N | 59.2E | 1333 | MS | 94 | 1 | 1 | 0 | 1.4 | -12.4 | 12.5 |
| 40763 | 35.2N | 58.5E | 1060 | MS | 52 | 0 | 0 | 0 | 0.9 | -5.8 | 5.9 |
| 40783 | 32.4N | 49.7E | 1972 | MS | 52 | 1 | 2 | 0 | 1.2 | -5.5 | 5.6 |
| 40789 | 33.8N | 55.1E | 921 | MS | 35 | 0 | 0 | 0 | 0.9 | 9.0 | 9.0 |
| 40812 | 32.0N | 49.3E | 372 | MS | 53 | 1 | 2 | 58 | 1.0 | 4.9 | 5.0 |
| 40836 | 30.8N | 51.7E | 1880 | MS | 44 | 2 | 5 | 0 | 1.1 | 8.5 | 8.6 |
| 40859 | 29.0N | 53.7E | 1383 | MS | 49 | 0 | 0 | 2 | 1.6 | 9.4 | 9.5 |
| 41254 | 23.1N | 57.7E | 1755 | S8 | 51 | 51 | 100 | 0 | | | |
| 41396 | 16.0N | 48.9E | 700 | MS | 45 | 1 | 2 | 0 | 0.9 | 7.3 | 7.4 |
| 41466 | 13.7N | 44.1E | 1402 | 8 | 31 | 0 | 0 | 0 | 0.6 | -5.5 | 5.5 |
| 44212 | 50.0N | 92.1E | 940 | S | 94 | 1 | 1 | 30 | 2.1 | 6.0 | 6.4 |
| 44239 | 48.8N | 103.6E | 1209 | MS | 95 | 0 | 0 | 1 | 1.4 | -4.3 | 4.5 |
| 44256 | 49.6N | 114.4E | 706 | MS | 86 | 1 | 1 | 1 | 1.5 | -4.5 | 4.7 |
| 44416 | 28.6N | 81.6E | 720 | MS | 57 | 1 | 2 | 0 | 1.3 | 4.6 | 4.8 |
| 51334 | 44.6N | 82.9E | 321 | M | 113 | 0 | 0 | 0 | 3.5 | 6.2 | 7.1 |
| 51379 | 44.0N | 89.6E | 794 | M | 111 | 0 | 0 | 0 | 2.8 | 7.3 | 7.8 |
| 51495 | 43.5N | 91.6E | 874 | M | 113 | 1 | 1 | 0 | 2.4 | 10.4 | 10.7 |
| 52602 | 38.8N | 93.4E | 2734 | S | 113 | 0 | 0 | 0 | 1.4 | -4.4 | 4.6 |
| 52955 | 35.6N | 100.8E | 3201 | S | 113 | 6 | 5 | 0 | 0.9 | 13.3 | 13.3 |
| 53083 | 44.6N | 114.2E | 1183 | M | 112 | 0 | 0 | 0 | 3.2 | 6.4 | 7.2 |
| 53352 | 41.7N | 110.4E | 1377 | M | 113 | 1 | 1 | 0 | 3.2 | 6.8 | 7.5 |
| 53480 | 41.0N | 113.1E | 1416 | M | 113 | 0 | 0 | 26 | 3.1 | 4.3 | 5.3 |
| 53502 | 39.8N | 105.8E | 1033 | M | 113 | 0 | 0 | 32 | 2.3 | 4.3 | 4.9 |
| 53588 | 39.0N | 113.5E | 2898 | S | 112 | 112 | 100 | 0 | | | |

## WMO REGION 2:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 53705 | 37.5N | 105.7E | 1185 | M | 113 | 0 | 0 | 9 | 2.1 | 4.2 | 4.7 |
| 54386 | 41.4N | 128.2E | 1018 | M | 111 | 2 | 2 | 5 | 3.2 | 4.6 | 5.6 |
| 56385 | 29.5N | 103.3E | 3049 | S | 112 | 0 | 0 | 16 | 2.5 | -5.0 | 5.6 |
| 56444 | 28.5N | 98.9E | 3488 | S | 114 | 20 | 18 | 0 | 0.6 | 13.9 | 13.9 |
| 56462 | 29.0N | 101.5E | 2994 | S | 112 | 1 | 1 | 4 | 1.7 | 8.6 | 8.8 |
| 57713 | 27.7N | 106.9E | 845 | M | 111 | 0 | 0 | 0 | 1.9 | 4.7 | 5.1 |
| 57816 | 26.6N | 106.7E | 1074 | MS | 114 | 26 | 23 | 49 | 3.1 | -13.2 | 13.6 |
| 57832 | 27.0N | 108.7E | 611 | M | 111 | 0 | 0 | 0 | 1.5 | 4.0 | 4.3 |
| 57922 | 25.8N | 107.6E | 971 | M | 112 | 0 | 0 | 0 | 1.6 | 4.9 | 5.2 |
| 59007 | 24.1N | 105.1E | 1251 | M | 113 | 1 | 1 | 6 | 2.2 | 5.8 | 6.2 |

## WMO REGION 3:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 80099 | 7.1N | 70.7W | 128 | MS | 46 | 0 | 0 | 0 | 1.1 | -6.7 | 6.8 |
| 82704 | 7.6S | 72.7W | 170 | MS | 75 | 0 | 0 | 0 | 1.6 | -4.1 | 4.4 |
| 83214 | 10.3S | 54.9W | 285 | MS | 78 | 1 | 1 | 0 | 2.1 | -6.1 | 6.5 |
| 83235 | 12.4S | 46.4W | 604 | MS | 86 | 0 | 0 | 0 | 1.0 | 6.5 | 6.6 |
| 83319 | 14.7S | 52.4W | 315 | MS | 81 | 0 | 0 | 0 | 1.2 | -4.7 | 4.9 |
| 83332 | 14.1S | 46.4W | 826 | MS | 85 | 11 | 13 | 0 | 0.9 | 13.0 | 13.0 |
| 83376 | 15.9S | 49.0W | 740 | MS | 85 | 0 | 0 | 0 | 0.9 | -4.1 | 4.2 |
| 83408 | 14.3S | 43.8W | 447 | MS | 79 | 0 | 0 | 1 | 1.2 | 10.2 | 10.3 |
| 83423 | 16.7S | 49.3W | 741 | MS | 85 | 0 | 0 | 0 | 0.8 | -4.8 | 4.9 |
| 83488 | 17.8S | 42.9W | 1097 | MS | 82 | 82 | 100 | 0 |  |  |  |
| 83531 | 18.6S | 46.5W | 940 | MS | 69 | 0 | 0 | 0 | 1.3 | -6.7 | 6.8 |
| 83587 | 19.9S | 43.9W | 850 | MS | 84 | 0 | 0 | 0 | 0.9 | -6.8 | 6.9 |
| 83704 | 22.3S | 53.9W | 369 | MS | 82 | 1 | 1 | 0 | 1.4 | -10.0 | 10.1 |
| 83773 | 23.1S | 48.9W | 793 | MS | 48 | 39 | 81 | 85 | 1.5 | -11.3 | 11.4 |
| 83836 | 25.5S | 50.6W | 837 | MS | 84 | 0 | 0 | 0 | 0.9 | -4.9 | 5.0 |
| 83953 | 30.9S | 55.5W | 231 | MS | 84 | 1 | 1 | 0 | 1.1 | -10.8 | 10.9 |
| 84377 | 3.8S | 73.3W | 125 | MS | 89 | 0 | 0 | 0 | 1.3 | 4.2 | 4.4 |
| 84425 | 5.9S | 76.1W | 179 | MS | 47 | 0 | 0 | 0 | 1.6 | 5.3 | 5.5 |
| 84455 | 6.5S | 76.4W | 281 | MS | 67 | 0 | 0 | 0 | 1.5 | 5.1 | 5.3 |
| 84472 | 7.1S | 78.5W | 2620 | S | 47 | 1 | 2 | 0 | 0.7 | -5.8 | 5.8 |
| 84474 | 7.2S | 76.7W | 350 | S | 47 | 1 | 2 | 0 | 1.5 | 10.2 | 10.3 |
| 84542 | 9.4S | 77.6W | 2750 | S | 41 | 0 | 0 | 15 | 1.2 | 4.3 | 4.5 |
| 84686 | 13.6S | 72.0W | 3248 | S | 90 | 0 | 0 | 0 | 0.8 | -4.5 | 4.6 |
| 84688 | 13.7S | 73.4W | 3444 | S | 43 | 0 | 0 | 0 | 0.8 | -11.2 | 11.2 |
| 84782 | 18.1S | 70.3W | 468 | MS | 90 | 0 | 0 | 0 | 1.2 | 6.7 | 6.8 |
| 85141 | 14.5S | 67.6W | 204 | MS | 54 | 0 | 0 | 2 | 2.1 | 4.2 | 4.7 |
| 85230 | 17.6S | 69.6W | 4054 | S | 23 | 1 | 4 | 4 | 0.7 | 5.4 | 5.4 |
| 85264 | 18.5S | 64.1W | 1998 | S | 49 | 25 | 51 | 96 | 1.8 | -12.9 | 13.0 |
| 85312 | 19.8S | 63.9W | 992 | S | 44 | 1 | 2 | 0 | 1.4 | -9.3 | 9.4 |
| 85432 | 22.5S | 68.9W | 2320 | S8 | 77 | 0 | 0 | 0 | 0.8 | 6.1 | 6.2 |
| 85836 | 43.6S | 71.8W | 277 | M | 41 | 1 | 2 | 2 | 2.2 | 4.4 | 4.9 |
| 88986 | 59.4S | 27.3W | 78 | S | 91 | 91 | 100 | 41 |  |  |  |

## WMO REGION 4:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 70194 | 66.6N | 145.3W | 431 | S | 89 | 89 | 100 | 0 |  |  |  |
| 71176 | 60.0N | 64.2W | 551 | MS | 115 | 0 | 0 | 8 | 1.6 | -4.9 | 5.2 |
| 71177 | 57.1N | 61.5W | 834 | S | 113 | 0 | 0 | 1 | 1.9 | -4.6 | 5.0 |
| 71179 | 54.7N | 58.4W | 683 | MS | 116 | 0 | 0 | 10 | 1.8 | -4.2 | 4.6 |
| 71434 | 55.2N | 85.1W | 10 | MS | 116 | 0 | 0 | 0 | 1.7 | -5.2 | 5.5 |
| 71492 | 69.2N | 122.4W | 552 | S | 108 | 0 | 0 | 1 | 1.5 | -4.6 | 4.8 |
| 71812 | 49.8N | 77.8W | 281 | MS | 116 | 100 | 86 | 23 | 3.8 | 8.8 | 9.6 |
| 76055 | 31.0N | 114.9W | 440 | MS | 63 | 63 | 100 | 0 |  |  |  |
| 76118 | 30.4N | 109.7W | 1040 | MS | 34 | 0 | 0 | 0 | 0.7 | -12.4 | 12.4 |
| 76632 | 20.1N | 98.7W | 2417 | MS | 35 | 0 | 0 | 0 | 0.6 | -5.1 | 5.1 |

WMO REGION 4:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 76658 | 19.2N | 103.7W | 494 | MS | 45 | 1 | 2 | 2 | 0.7 | 6.5 | 6.5 |
| 76750 | 18.5N | 88.3W | 9 | MS | 98 | 0 | 0 | 1 | 1.7 | -8.7 | 8.9 |
| 76773 | 17.8N | 97.8W | 1680 | MS | 52 | 0 | 0 | 0 | 1.3 | 8.1 | 8.2 |
| 76775 | 17.1N | 96.7W | 1550 | MS | 72 | 0 | 0 | 0 | 1.0 | 4.5 | 4.6 |
| 76845 | 16.7N | 92.6W | 2276 | MS | 66 | 66 | 100 | 0 | | | |
| 78718 | 14.4N | 87.6W | 626 | MS | 32 | 27 | 84 | 0 | 0.3 | -14.4 | 14.4 |

WMO REGION 5:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 91163 | 21.9N | 159.6W | 7 | 8 | 338 | 338 | 100 | 0 | | | |
| 92010 | 6.1S | 145.4E | 1587 | M | 43 | 0 | 0 | 2 | 1.2 | 9.6 | 9.7 |
| 94576 | 27.5S | 153.0E | 38 | MS | 115 | 0 | 0 | 50 | 0.7 | 8.0 | 8.0 |
| 95611 | 34.6S | 118.5E | 107 | MS | 103 | 0 | 0 | 1 | 2.2 | 9.6 | 9.8 |
| 95909 | 36.5S | 148.3E | 1957 | MS | 116 | 116 | 100 | 0 | | | |
| 96755 | 6.6S | 106.9E | 171 | M | 45 | 12 | 27 | 31 | 3.4 | 0.8 | 3.5 |
| 96801 | 7.3S | 108.3E | 335 | M | 36 | 9 | 25 | 0 | 0.5 | 1.9 | 2.0 |

WMO REGION 6:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 06253 | 56.4N | 2.1E | 34 | M | 298 | 0 | 0 | 27 | 1.1 | 4.2 | 4.3 |
| 06255 | 61.2N | 1.1E | 47 | M | 336 | 1 | 0 | 16 | 1.2 | 5.8 | 5.9 |
| 10557 | 50.5N | 11.1E | 845 | S8 | 348 | 348 | 100 | 0 | | | |
| 10954 | 47.8N | 10.9E | 540 | S8 | 186 | 186 | 100 | 0 | | | |
| 11185 | 47.5N | 16.0E | 991 | S8 | 65 | 65 | 100 | 0 | | | |
| 12140 | 54.4N | 18.7E | 2 | MS | 115 | 0 | 0 | 0 | 0.8 | 8.1 | 8.1 |
| 13269 | 44.3N | 19.9E | 176 | MS | 111 | 1 | 1 | 1 | 0.9 | 8.5 | 8.5 |
| 13581 | 41.2N | 21.5E | -9999 | 8 | 78 | 0 | 0 | 4 | 1.0 | -4.1 | 4.2 |
| 13593 | 41.3N | 22.4E | 1031 | 8 | 65 | 0 | 0 | 12 | 2.5 | -5.2 | 5.8 |
| 14554 | 44.9N | 18.4E | 140 | S | 35 | 0 | 0 | 0 | 0.9 | -12.8 | 12.8 |
| 14650 | 43.8N | 18.0E | 967 | S | 39 | 2 | 5 | 5 | 3.5 | -5.2 | 6.3 |
| 16227 | 41.9N | 13.6E | 655 | MS | 285 | 239 | 84 | 0 | 0.9 | -13.5 | 13.5 |
| 17042 | 41.4N | 41.4E | 33 | M | 96 | 0 | 0 | 47 | 1.7 | 5.7 | 5.9 |
| 17092 | 39.8N | 39.5E | 1218 | S8 | 116 | 0 | 0 | 0 | 1.6 | 9.6 | 9.7 |
| 17203 | 38.9N | 40.5E | 1177 | S8 | 97 | 0 | 0 | 1 | 1.4 | 5.6 | 5.8 |

ANTARCTIC:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 89108 | 89.0S | 1.0W | 2755 | S | 271 | 0 | 0 | 0 | 1.1 | 4.0 | 4.1 |
| 89264 | 71.4S | 68.9W | 780 | S | 234 | 0 | 0 | 6 | 1.6 | 5.8 | 6.0 |
| 89266 | 72.2S | 60.3W | 91 | S | 241 | 235 | 98 | 0 | 7.2 | 0.2 | 7.2 |
| 89272 | 75.0S | 70.8W | 1395 | S | 221 | 161 | 73 | 34 | 1.1 | 0.8 | 1.4 |
| 89327 | 73.2S | 127.1W | 30 | S | 238 | 224 | 94 | 0 | 7.2 | -7.1 | 10.1 |
| 89612 | 66.3S | 110.8E | 390 | S | 208 | 208 | 100 | 0 | | | |
| 89744 | 74.0S | 43.0E | 3353 | S | 265 | 0 | 0 | 0 | 0.8 | 7.0 | 7.0 |
| 89769 | 78.5S | 168.4E | 50 | S | 368 | 366 | 99 | 0 | 0.1 | -14.7 | 14.7 |
| 89805 | 74.1S | 109.8E | 3096 | S | 200 | 51 | 26 | 0 | 2.1 | 3.1 | 3.7 |
| 89847 | 67.6S | 146.0E | 30 | S | 291 | 3 | 1 | 0 | 1.8 | -9.0 | 9.2 |

## TABLE 4

## MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Statistics for each airline carrier.

**Area monitored** :90°N - 90°S, 180°W - 180°E.

**Standard of comparison** :Background field from UKMO global model.

**Observation times** :All hours combined.

**Level(s) monitored** :70.0 - 500.0 hPa

**Elements monitored** :TEMP in °C ; WIND in m s$^{-1}$

**Parameters monitored**

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

**GROSS ERROR LIMITS** :10.0 °C ; 60 m s$^{-1}$ Vector Wind

**SELECTION CRITERIA** :N REP $\geq$ 20

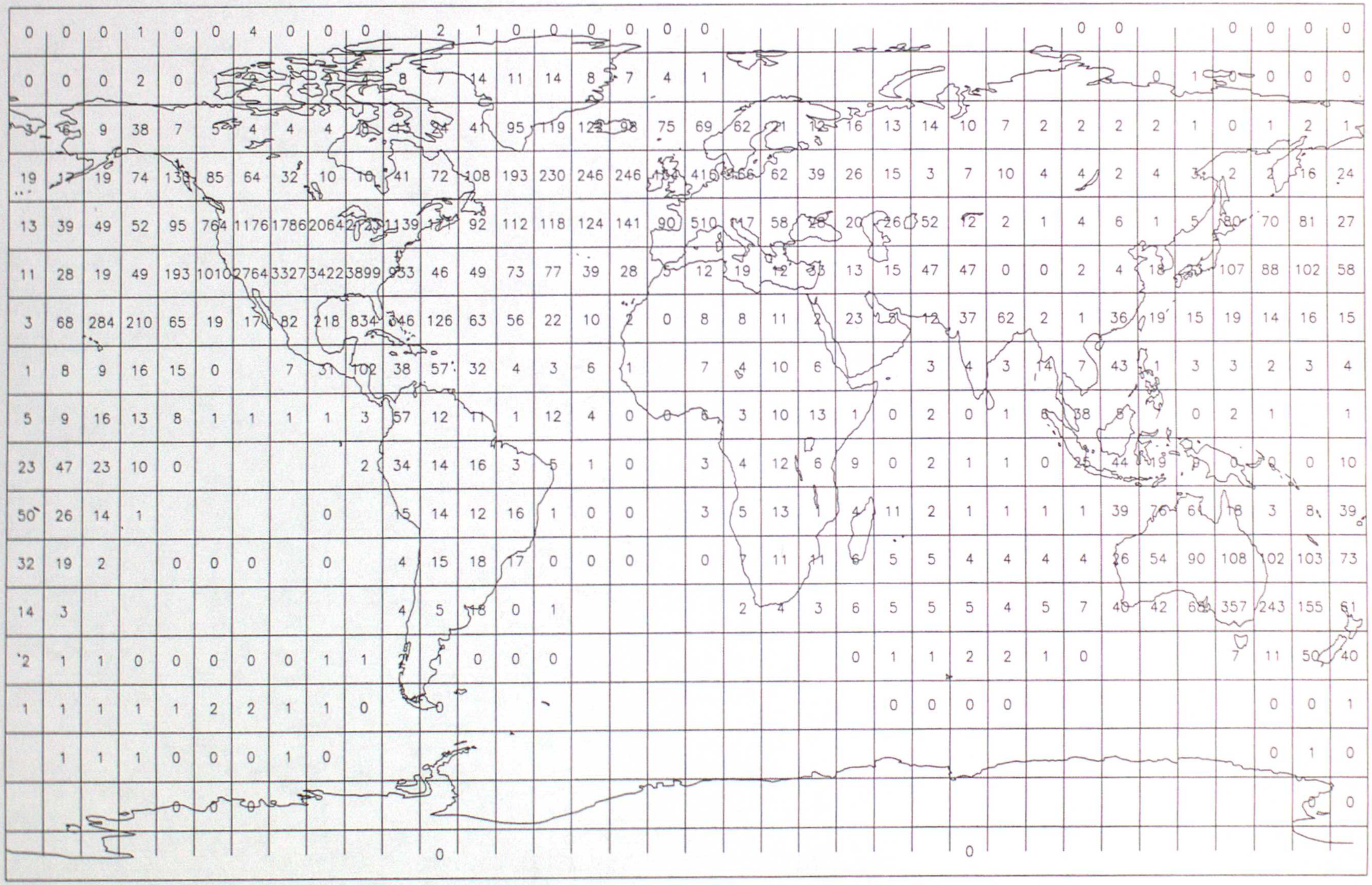
**NB:** All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

| | | TEMPERATURE | | | | WIND | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAA | 42 | 5 | 48 | 2.1 | 0.8 | 42 | 0 | 45 | 0 | 6.5 | 2.9 |
| AAH | 319 | 6 | 36 | 1.9 | 0.3 | 321 | 1 | 34 | 0 | 10.3 | 1.5 |
| AAL | 5517 | 0 | 15 | 1.8 | 0.1 | 5509 | 0 | 16 | 0 | 9.2 | 1.0 |
| AAR | 1584 | 1 | 9 | 2.2 | -0.6 | 1571 | 0 | 10 | 0 | 9.3 | 0.4 |
| ABB | 25 | 0 | 4 | 1.6 | 0.5 | 26 | 0 | 8 | 0 | 12.1 | 2.0 |
| ACA | 1760 | 0 | 6 | 2.3 | 0.3 | 1778 | 0 | 6 | 0 | 8.4 | 0.6 |
| ACI | 68 | 4 | 51 | 1.1 | 0.8 | 65 | 0 | 51 | 0 | 10.0 | 3.4 |
| AEA | 456 | 1 | 3 | 2.0 | 0.5 | 445 | 0 | 4 | 0 | 8.2 | 1.0 |
| AEL | 758 | 1 | 10 | 1.7 | -0.9 | 755 | 0 | 11 | 0 | 9.0 | 0.6 |
| AEY | 299 | 1 | 4 | 1.9 | 0.7 | 299 | 0 | 4 | 0 | 9.4 | 0.5 |
| AFL | 521 | 0 | 4 | 1.9 | 0.2 | 519 | 0 | 5 | 0 | 9.0 | 0.3 |
| AFR | 2169 | 1 | 7 | 1.7 | -0.1 | 2183 | 0 | 8 | 0 | 8.4 | 1.1 |
| AIB | 25 | 4 | 28 | 1.9 | 0.1 | 25 | 0 | 20 | 0 | 9.0 | 1.0 |
| AIH | 296 | 1 | 4 | 1.9 | 0.2 | 295 | 1 | 4 | 0 | 8.9 | 1.0 |
| AJM | 117 | 0 | 3 | 2.0 | -0.5 | 119 | 0 | 1 | 0 | 9.4 | 0.4 |
| AMM | 116 | 0 | 8 | 1.7 | 0.5 | 115 | 0 | 9 | 0 | 9.0 | 2.4 |
| AMT | 620 | 2 | 39 | 2.7 | 1.5 | 626 | 0 | 39 | 0 | 10.4 | 0.9 |
| AMX | 300 | 2 | 6 | 2.2 | 0.2 | 296 | 0 | 6 | 0 | 9.8 | 1.6 |
| ANA | 1221 | 1 | 9 | 2.2 | -0.2 | 1219 | 0 | 10 | 0 | 9.4 | 0.9 |
| ANZ | 4496 | 1 | 43 | 1.5 | 0.2 | 4461 | 0 | 42 | 0 | 7.7 | 0.9 |
| AOM | 1181 | 1 | 8 | 1.8 | 0.6 | 1187 | 0 | 8 | 0 | 8.3 | 1.0 |
| ARG | 86 | 5 | 28 | 2.8 | 0.7 | 85 | 0 | 25 | 0 | 8.5 | 0.7 |
| ASY | 29 | 0 | 38 | 2.2 | 0.8 | 30 | 0 | 40 | 0 | 8.7 | 3.3 |
| AUA | 38 | 0 | 0 | 1.5 | -0.1 | 37 | 0 | 0 | 0 | 6.7 | 0.7 |
| AVA | 548 | 0 | 2 | 1.9 | 0.2 | 553 | 0 | 3 | 0 | 9.5 | 1.6 |
| AVN | 102 | 1 | 32 | 1.4 | 0.6 | 102 | 0 | 31 | 0 | 6.4 | 1.9 |
| AXF | 88 | 16 | 49 | 1.2 | 0.2 | 75 | 0 | 40 | 0 | 8.8 | 2.7 |
| AZA | 575 | 2 | 5 | 2.0 | 0.6 | 574 | 1 | 6 | 0 | 9.1 | 0.8 |
| BAL | 382 | 0 | 8 | 1.7 | 0.2 | 382 | 0 | 10 | 0 | 9.3 | 1.0 |
| BAW | 1661 | 1 | 7 | 2.0 | -0.1 | 1672 | 0 | 7 | 0 | 7.5 | 0.9 |
| BBB | 50 | 0 | 12 | 1.3 | 0.1 | 47 | 2 | 17 | 0 | 8.9 | 1.3 |
| BLX | 54 | 4 | 7 | 1.8 | -0.1 | 50 | 0 | 6 | 0 | 10.4 | 3.9 |
| BWA | 336 | 1 | 8 | 2.0 | 1.0 | 334 | 0 | 9 | 0 | 10.7 | 1.0 |
| CAL | 355 | 1 | 8 | 1.8 | 0.2 | 369 | 1 | 8 | 0 | 8.5 | 0.7 |
| CCA | 185 | 1 | 66 | 3.2 | 0.2 | 214 | 1 | 100 | 0 | 14.9 | -0.9 |
| CDN | 2081 | 0 | 7 | 2.0 | -0.1 | 2089 | 0 | 7 | 0 | 9.0 | 0.6 |
| CES | 290 | 1 | 6 | 2.3 | 0.0 | 290 | 0 | 100 | 0 | 12.3 | -0.1 |
| CFC | 47 | 0 | 15 | 2.0 | 0.7 | 48 | 0 | 23 | 0 | 12.9 | 1.4 |
| CFG | 1514 | 1 | 4 | 1.8 | -0.8 | 1503 | 0 | 5 | 0 | 9.1 | 1.1 |
| CKS | 404 | 1 | 34 | 2.2 | 1.1 | 403 | 0 | 34 | 0 | 9.5 | 1.8 |
| CKT | 205 | 1 | 4 | 1.8 | 1.2 | 191 | 0 | 5 | 0 | 7.4 | -0.3 |
| CLX | 379 | 0 | 7 | 1.9 | -0.3 | 379 | 0 | 8 | 0 | 8.7 | 0.7 |
| CMI | 486 | 1 | 4 | 1.8 | 0.6 | 490 | 1 | 4 | 0 | 9.0 | 1.6 |
| CMM | 423 | 1 | 21 | 2.2 | 0.0 | 415 | 1 | 21 | 0 | 10.9 | 2.1 |
| COA | 1385 | 1 | 19 | 1.7 | 0.0 | 1390 | 0 | 23 | 0 | 11.9 | 1.9 |
| CPA | 61 | 2 | 11 | 1.4 | 0.2 | 62 | 2 | 15 | 0 | 8.0 | 1.3 |
| CRL | 1070 | 1 | 5 | 1.7 | 0.7 | 1072 | 0 | 5 | 0 | 7.9 | 1.0 |
| CSN | 107 | 0 | 12 | 2.0 | 0.7 | 107 | 0 | 15 | 0 | 8.9 | 0.3 |
| CTB | 185 | 1 | 4 | 1.5 | -0.1 | 188 | 0 | 4 | 0 | 9.3 | 1.5 |
| CTM | 59 | 0 | 34 | 3.4 | -1.8 | 57 | 0 | 32 | 0 | 9.0 | 0.5 |
| CUB | 297 | 0 | 3 | 2.0 | 1.1 | 295 | 0 | 4 | 0 | 8.4 | 0.3 |
| DAL | 3607 | 0 | 27 | 1.9 | 0.3 | 3630 | 0 | 28 | 0 | 9.0 | 0.9 |
| DBY | 532 | 1 | 3 | 1.5 | -0.4 | 526 | 0 | 4 | 0 | 8.6 | 1.1 |
| DCS | 25 | 0 | 0 | 1.2 | -0.2 | 25 | 0 | 4 | 0 | 11.4 | 0.4 |
| DLH | 2482 | 1 | 6 | 1.9 | 0.1 | 2457 | 0 | 6 | 0 | 7.6 | 0.9 |
| EEZ | 260 | 2 | 100 | 4.0 | 2.3 | 249 | 0 | 9 | 0 | 9.1 | 1.4 |
| EIA | 189 | 1 | 35 | 1.6 | 0.7 | 186 | 0 | 37 | 0 | 9.0 | 1.8 |
| EIN | 59 | 0 | 7 | 1.7 | -0.2 | 61 | 0 | 7 | 0 | 7.1 | 1.5 |
| ELY | 95 | 0 | 3 | 1.6 | 0.2 | 104 | 1 | 7 | 0 | 8.3 | 0.4 |

| | TEMPERATURE | | | | | WIND | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| EVA | 1577 | 1 | 7 | 1.9 | -0.3 | 1600 | 0 | 8 | 0 | 8.9 | 0.1 |
| EWW | 94 | 0 | 10 | 2.4 | 0.5 | 96 | 0 | 11 | 0 | 9.9 | 1.2 |
| FDX | 1608 | 1 | 16 | 1.9 | 0.5 | 1617 | 0 | 17 | 0 | 9.6 | 1.1 |
| FIN | 362 | 0 | 3 | 1.8 | 0.2 | 363 | 0 | 4 | 0 | 8.0 | 0.4 |
| FJI | 870 | 8 | 44 | 1.8 | 0.7 | 806 | 0 | 38 | 0 | 8.8 | 1.4 |
| FOM | 350 | 10 | 45 | 1.5 | 0.5 | 318 | 0 | 40 | 0 | 9.0 | 1.4 |
| FWQ | 42 | 0 | 45 | 0.9 | 0.3 | 42 | 0 | 45 | 0 | 4.9 | 0.1 |
| GAF | 24 | 0 | 17 | 2.6 | -1.1 | 24 | 0 | 25 | 0 | 16.1 | -3.2 |
| GCO | 71 | 0 | 6 | 1.8 | 0.7 | 78 | 0 | 10 | 0 | 13.1 | 1.5 |
| GHA | 36 | 0 | 6 | 1.3 | -0.6 | 36 | 0 | 6 | 0 | 8.5 | 2.3 |
| GIA | 35 | 0 | 11 | 1.5 | 1.1 | 34 | 0 | 12 | 0 | 5.7 | 2.3 |
| GRL | 61 | 0 | 3 | 1.7 | 0.3 | 64 | 0 | 6 | 0 | 6.5 | 0.6 |
| GTI | 203 | 0 | 10 | 2.0 | -0.4 | 215 | 0 | 10 | 0 | 9.3 | 0.8 |
| HAL | 3601 | 1 | 34 | 1.9 | 0.4 | 3579 | 0 | 36 | 0 | 11.8 | 1.5 |
| HLF | 103 | 2 | 4 | 1.7 | -0.3 | 104 | 0 | 3 | 0 | 9.6 | 1.9 |
| HRH | 206 | 16 | 73 | 1.4 | 0.0 | 177 | 0 | 68 | 0 | 10.0 | 2.4 |
| HVN | 22 | 0 | 9 | 1.0 | -0.2 | 22 | 0 | 14 | 0 | 8.4 | 1.4 |
| IBE | 2897 | 1 | 9 | 1.9 | 0.7 | 2866 | 0 | 11 | 0 | 9.8 | 0.9 |
| ICE | 1192 | 0 | 2 | 1.7 | -0.1 | 1182 | 0 | 3 | 0 | 7.5 | 0.8 |
| IWD | 153 | 0 | 6 | 1.6 | -0.2 | 153 | 1 | 5 | 0 | 8.2 | 0.9 |
| JAA | 69 | 0 | 1 | 2.5 | 2.1 | 69 | 0 | 1 | 0 | 7.8 | 3.5 |
| JAL | 6600 | 0 | 5 | 2.0 | 0.2 | 6587 | 0 | 6 | 0 | 8.7 | 1.0 |
| JAZ | 350 | 0 | 4 | 1.8 | 0.9 | 348 | 0 | 4 | 0 | 7.7 | 0.9 |
| JKK | 266 | 1 | 8 | 1.5 | 0.0 | 231 | 0 | 8 | 0 | 8.1 | 0.7 |
| KAL | 3421 | 1 | 10 | 2.1 | -0.3 | 3394 | 0 | 10 | 0 | 9.4 | 0.7 |
| KLM | 2727 | 0 | 11 | 1.8 | 0.3 | 2757 | 0 | 11 | 0 | 7.8 | 0.7 |
| LAN | 57 | 2 | 25 | 2.6 | 0.1 | 61 | 0 | 20 | 0 | 9.6 | 3.0 |
| LAP | 53 | 2 | 30 | 2.9 | 1.9 | 53 | 0 | 30 | 0 | 13.8 | 3.1 |
| LDA | 136 | 0 | 6 | 1.2 | 0.0 | 135 | 0 | 7 | 0 | 8.3 | 0.9 |
| LDI | 979 | 0 | 100 | 2.9 | 0.6 | 979 | 0 | 9 | 0 | 8.4 | 0.7 |
| LIB | 554 | 1 | 5 | 2.0 | 1.1 | 555 | 0 | 5 | 0 | 9.3 | 1.7 |
| LOT | 102 | 0 | 7 | 1.9 | -1.0 | 99 | 0 | 9 | 0 | 8.4 | -0.9 |
| LPR | 21 | 0 | 5 | 2.7 | 1.3 | 21 | 0 | 5 | 0 | 11.7 | 1.4 |
| LTU | 678 | 0 | 3 | 1.8 | -0.1 | 660 | 0 | 4 | 0 | 8.4 | 1.0 |
| MAS | 452 | 0 | 10 | 2.1 | 0.0 | 469 | 1 | 11 | 0 | 10.8 | 0.5 |
| MON | 148 | 2 | 3 | 1.6 | 0.0 | 151 | 0 | 3 | 0 | 7.5 | 1.0 |
| MPD | 331 | 1 | 7 | 2.0 | 0.3 | 325 | 0 | 7 | 0 | 9.3 | 1.2 |
| MPH | 853 | 1 | 4 | 1.9 | -0.6 | 856 | 0 | 5 | 0 | 9.0 | 0.5 |
| NCA | 708 | 0 | 3 | 2.1 | 0.4 | 699 | 0 | 3 | 0 | 8.9 | 0.7 |
| NVR | 34 | 0 | 6 | 1.9 | 0.2 | 33 | 0 | 3 | 0 | 7.7 | 1.1 |
| NWA | 9925 | 1 | 11 | 2.0 | 0.5 | 9888 | 0 | 11 | 0 | 9.1 | 0.7 |
| OAE | 55 | 0 | 35 | 1.6 | 0.2 | 54 | 0 | 43 | 0 | 16.2 | -3.3 |
| PAC | 265 | 1 | 27 | 2.1 | 0.5 | 270 | 0 | 29 | 0 | 12.6 | 1.8 |
| PAL | 1111 | 1 | 13 | 1.9 | -0.2 | 1064 | 0 | 14 | 0 | 10.0 | 0.3 |
| PAO | 299 | 10 | 64 | 1.5 | 0.4 | 273 | 0 | 60 | 0 | 7.9 | 0.4 |
| PUA | 28 | 4 | 43 | 2.6 | 1.3 | 26 | 0 | 46 | 0 | 11.1 | 1.9 |
| QFA | 2092 | 0 | 54 | 1.6 | 0.4 | 2082 | 0 | 55 | 0 | 8.1 | 0.8 |
| RAF | 79 | 0 | 6 | 1.8 | 1.2 | 78 | 0 | 9 | 0 | 8.2 | 0.7 |
| RAM | 67 | 3 | 6 | 1.8 | -0.8 | 67 | 0 | 12 | 0 | 13.7 | -0.1 |
| RCH | 269 | 3 | 19 | 2.4 | 0.4 | 264 | 0 | 58 | 0 | 12.0 | 1.1 |
| RJA | 33 | 0 | 3 | 2.2 | 0.2 | 32 | 0 | 6 | 0 | 11.9 | -1.6 |
| RKA | 102 | 0 | 1 | 1.9 | -0.7 | 95 | 1 | 1 | 0 | 7.7 | 1.2 |
| RRR | 107 | 3 | 11 | 1.8 | 0.1 | 111 | 2 | 11 | 0 | 9.1 | 1.8 |
| RYN | 391 | 1 | 38 | 2.0 | 1.0 | 394 | 1 | 39 | 0 | 9.9 | 0.3 |
| RZO | 124 | 3 | 4 | 1.7 | -0.5 | 122 | 0 | 2 | 0 | 8.8 | 2.2 |
| SAA | 364 | 0 | 4 | 1.9 | -0.5 | 355 | 0 | 4 | 0 | 8.1 | 1.2 |
| SAB | 24 | 0 | 4 | 2.0 | 0.4 | 24 | 0 | 8 | 0 | 10.5 | 2.5 |
| SAS | 1547 | 0 | 31 | 1.9 | -0.1 | 1541 | 0 | 31 | 0 | 7.3 | 0.4 |
| SIA | 563 | 0 | 7 | 1.8 | 0.1 | 567 | 0 | 7 | 0 | 7.3 | 0.7 |

| | TEMPERATURE | | | | | WIND | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| SLR | 222 | 0 | 9 | 1.9 | -1.0 | 222 | 0 | 8 | 0 | 7.3 | 1.3 |
| SNB | 86 | 0 | 5 | 1.7 | 0.6 | 87 | 0 | 5 | 0 | 8.2 | 1.1 |
| SOL | 61 | 2 | 2 | 1.4 | 1.0 | 56 | 0 | 0 | 0 | 6.5 | 1.3 |
| SVA | 87 | 2 | 9 | 2.1 | 0.3 | 98 | 0 | 6 | 0 | 10.5 | 0.5 |
| SWR | 114 | 1 | 7 | 1.7 | 0.5 | 113 | 0 | 6 | 0 | 8.5 | 1.8 |
| TAP | 455 | 2 | 8 | 1.7 | -0.2 | 450 | 0 | 7 | 0 | 8.9 | 1.1 |
| TBA | 32 | 3 | 47 | 3.4 | 1.3 | 34 | 0 | 50 | 0 | 15.1 | 0.4 |
| TCU | 31 | 0 | 6 | 1.3 | -0.8 | 29 | 0 | 7 | 0 | 7.3 | 0.7 |
| THA | 299 | 1 | 7 | 2.2 | -0.5 | 299 | 1 | 8 | 0 | 9.2 | 0.1 |
| THT | 154 | 5 | 36 | 2.4 | 0.1 | 152 | 0 | 31 | 0 | 7.9 | 1.0 |
| TOW | 98 | 1 | 4 | 1.6 | 0.3 | 98 | 0 | 4 | 0 | 9.0 | 2.6 |
| TPA | 44 | 2 | 14 | 1.1 | 0.2 | 45 | 0 | 13 | 0 | 7.2 | -0.2 |
| TSC | 168 | 1 | 12 | 2.2 | 0.6 | 168 | 0 | 13 | 0 | 11.8 | 2.3 |
| TWA | 1336 | 1 | 13 | 1.8 | 0.1 | 1262 | 0 | 13 | 0 | 9.3 | 1.1 |
| UAL | 69502 | 0 | 87 | 1.6 | -0.1 | 69526 | 0 | 87 | 0 | 7.7 | 0.8 |
| UPS | 1375 | 1 | 22 | 2.2 | 0.7 | 1379 | 0 | 22 | 0 | 9.0 | 0.8 |
| USA | 349 | 2 | 4 | 1.8 | -0.1 | 290 | 0 | 4 | 0 | 8.7 | 1.8 |
| VIR | 742 | 1 | 4 | 1.8 | -0.3 | 742 | 0 | 4 | 0 | 8.5 | 0.9 |
| VKG | 171 | 1 | 5 | 2.0 | -0.3 | 175 | 0 | 5 | 0 | 8.7 | 1.7 |
| VRG | 254 | 3 | 31 | 2.0 | 1.0 | 250 | 1 | 31 | 0 | 9.8 | 1.5 |
| VSP | 49 | 6 | 18 | 1.8 | 0.5 | 46 | 0 | 15 | 0 | 10.2 | 2.6 |
| VVR | 65 | 0 | 26 | 3.0 | 1.1 | 66 | 0 | 24 | 0 | 9.9 | 0.2 |
| WOA | 187 | 1 | 9 | 1.8 | 0.3 | 203 | 0 | 9 | 0 | 9.0 | 0.1 |
| AN | 18748 | 0 | 18 | 1.4 | 0.6 | 18748 | 0 | 18 | 0 | 5.5 | 0.7 |
| AR | 3222 | 0 | 100 | 2.9 | 2.6 | 3193 | 0 | 4 | 0 | 7.9 | 1.8 |
| BA | 7535 | 0 | 11 | 1.6 | 0.6 | 7472 | 1 | 12 | 0 | 8.6 | 0.4 |
| EU | 51860 | 1 | 24 | 1.8 | 0.0 | 51860 | 0 | 24 | 0 | 8.9 | 1.4 |
| KL | 6399 | 0 | 11 | 1.8 | 0.8 | 6370 | 0 | 12 | 0 | 8.8 | 0.9 |
| LN | 28 | 4 | 46 | 1.8 | 1.4 | 28 | 0 | 46 | 0 | 8.0 | 3.4 |
| MK | 3515 | 0 | 12 | 1.9 | 1.2 | 3506 | 0 | 12 | 0 | 9.0 | 0.4 |
| NZ | 3339 | 0 | 9 | 1.1 | 0.0 | 3339 | 0 | 9 | 0 | 6.4 | 0.6 |
| QF | 28139 | 0 | 12 | 1.3 | 0.7 | 28135 | 0 | 12 | 0 | 6.0 | 0.7 |
| SA | 2888 | 1 | 26 | 2.3 | 1.7 | 2879 | 0 | 10 | 0 | 9.2 | 0.3 |
| WA | 370 | 10 | 19 | 1.7 | 0.5 | 364 | 7 | 100 | 0 | 16.3 | -3.6 |
| XX | 3806 | 3 | 9 | 1.9 | 0.3 | 4357 | 0 | 100 | 0 | 12.2 | 1.0 |
| N | 704 | 1 | 20 | 2.3 | 0.7 | 725 | 0 | 22 | 0 | 10.9 | 1.4 |
| US ACARS | 544754 | 0 | 49 | 1.6 | 0.3 | 544172 | 0 | 50 | 0 | 6.9 | 0.9 |

MEAN DAILY COUNT OF AIRCRAFT   70 – 500 HPA   FIGURE 3
FEBRUARY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED


0 0 0 1 0 0 4 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 2 0 8 7 14 11 14 8 7 4 1 0 1 0 0 0 0
3 6 9 38 7 5 4 4 4 10 43 24 41 95 119 123 98 75 69 62 21 12 16 13 14 10 7 2 2 2 2 1 0 1 2 1
19 17 19 74 138 85 64 32 10 10 41 72 108 193 230 246 246 134 416 356 62 39 26 15 3 7 10 4 4 2 4 3 2 2 16 24
13 39 49 52 95 764 1176 1786 2064 2123 1139 171 92 112 118 124 141 90 510 117 58 28 20 26 52 12 2 1 4 6 1 5 80 70 81 27
11 28 19 49 193 1010 2764 3327 3422 3899 933 46 49 73 77 39 28 5 12 19 12 33 13 15 47 47 0 0 2 4 18 107 88 102 58
3 68 284 210 65 19 17 82 218 834 346 126 63 56 22 10 2 0 8 8 11 2 23 28 12 37 62 2 1 36 19 15 19 14 16 15
1 8 9 16 15 0 7 31 102 38 57 32 4 3 6 1 7 4 10 6 3 4 3 14 7 43 1 3 3 2 3 4
5 9 16 13 8 1 1 1 1 3 57 12 11 1 12 4 0 0 6 3 10 13 1 0 2 0 1 8 38 8 7 0 2 1 1
23 47 23 10 0 2 34 14 16 3 5 1 0 3 4 12 6 9 0 2 1 1 0 25 44 19 9 0 0 0 10
50 26 14 1 0 15 14 12 16 1 0 0 3 5 13 1 4 11 2 1 1 1 1 39 76 61 18 3 8 39
32 19 2 0 0 0 0 4 15 18 17 0 0 0 0 7 11 11 6 5 5 4 4 4 4 26 54 90 108 102 103 73
14 3 4 5 18 0 1 2 4 3 6 5 5 5 4 5 7 40 42 68 357 243 155 61
2 1 1 0 0 0 0 0 1 1 2 1 0 0 0 0 1 1 2 2 1 0 7 11 50 40
1 1 1 1 1 2 2 1 1 0 0 0 0 0 0 0 0 1
1 1 1 0 0 0 1 0 0 1 0
0 0 0 0 0
0 0

AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA
FEBRUARY 2000
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4

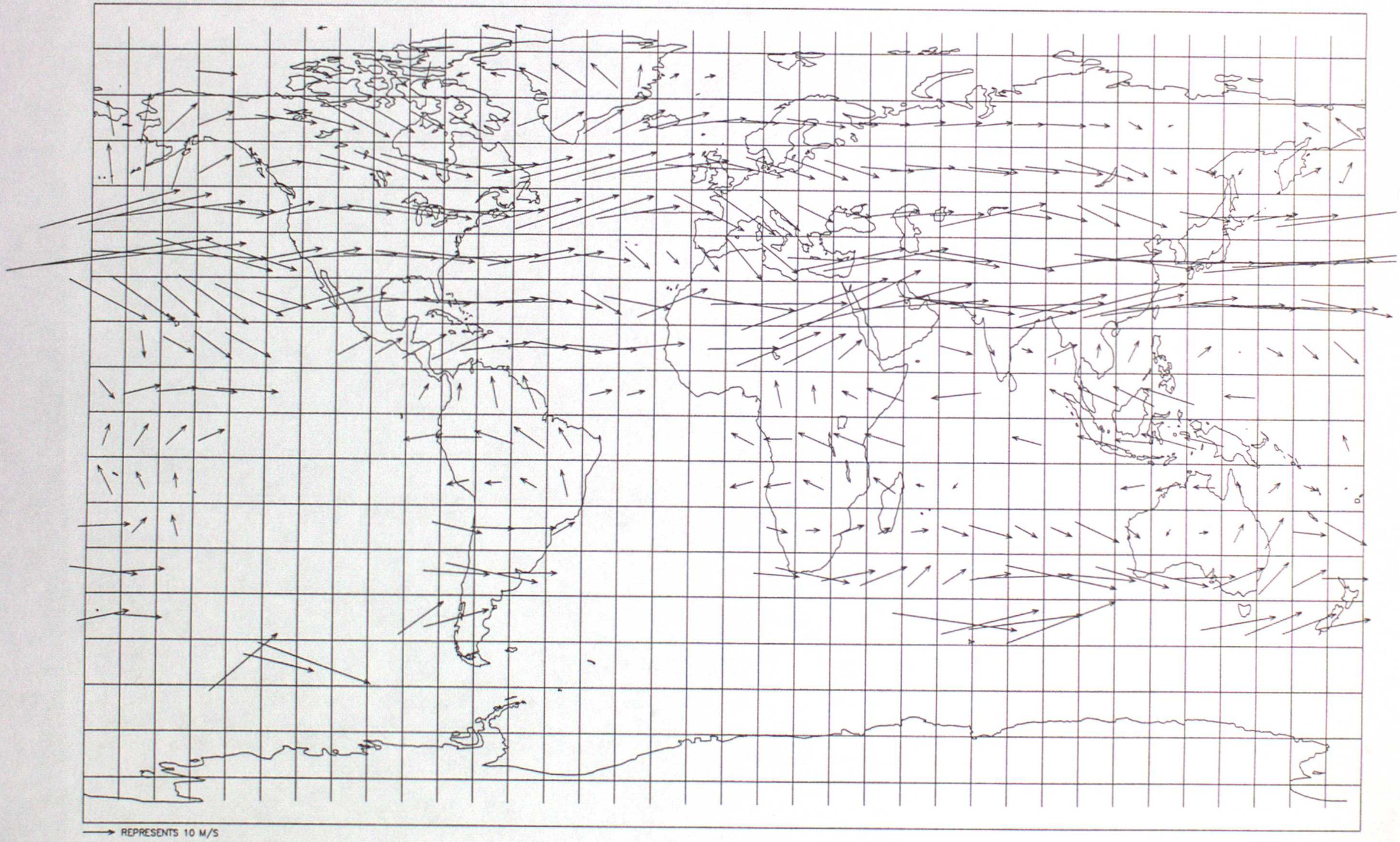
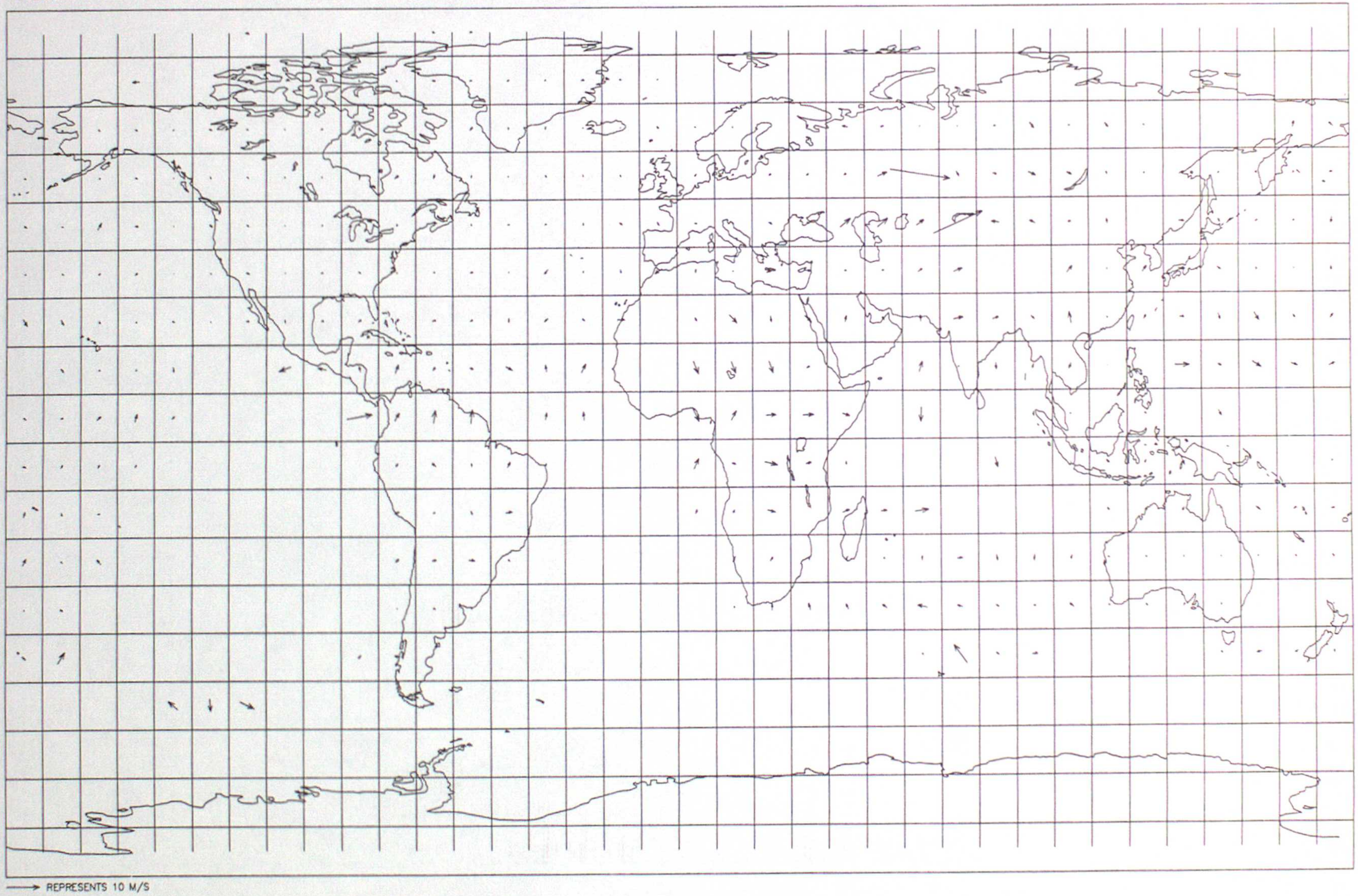
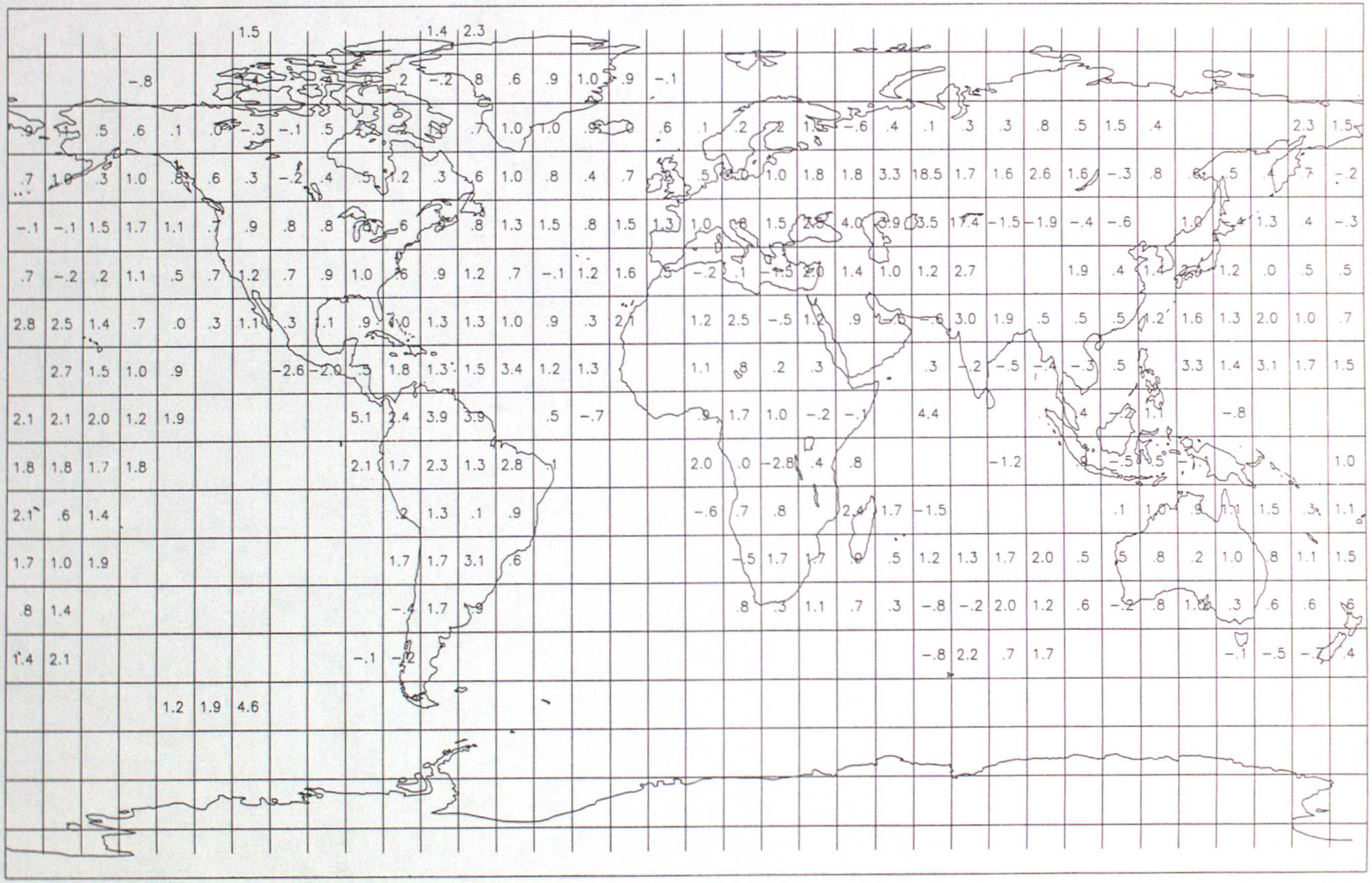


FIGURE 5

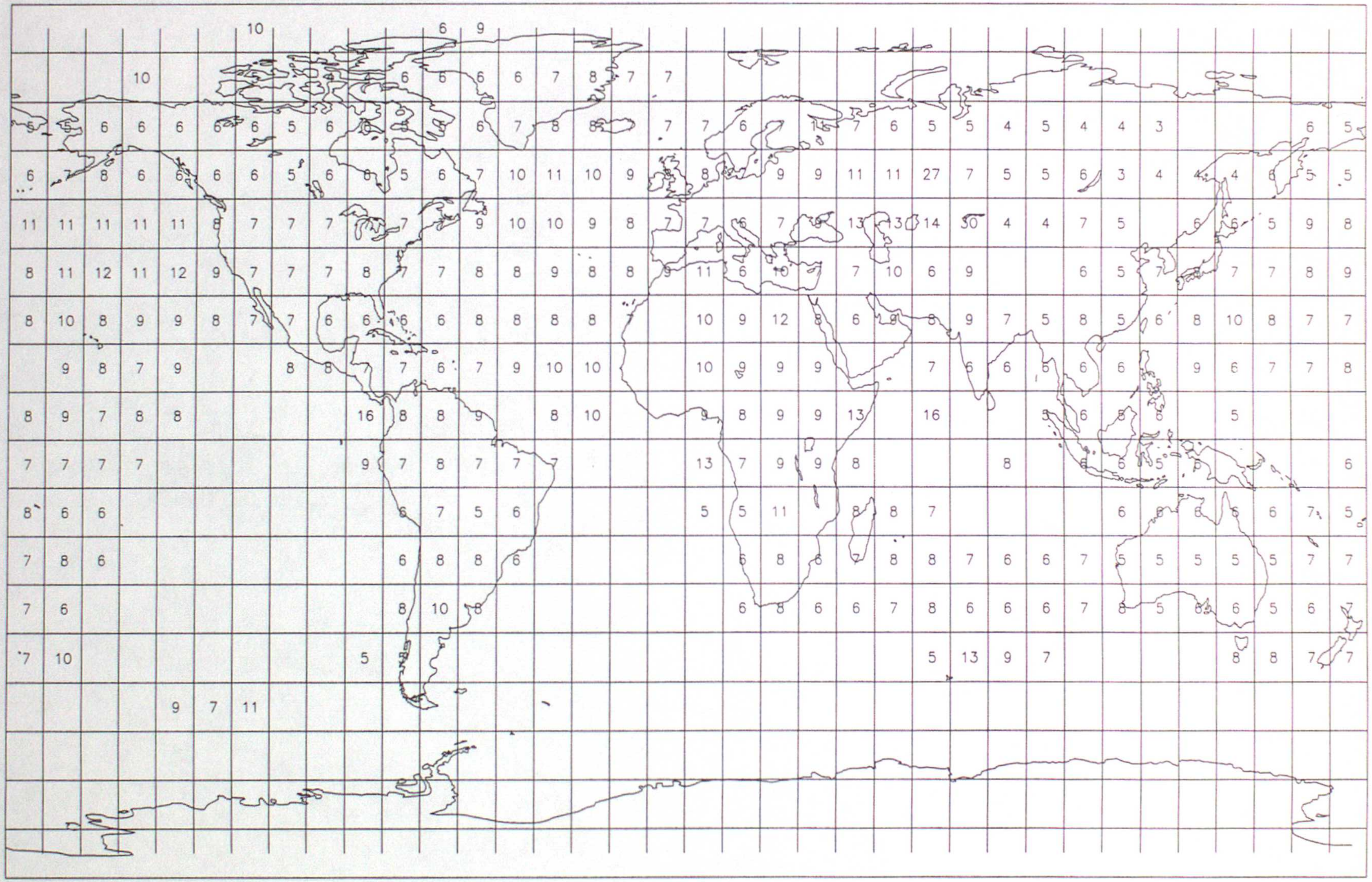
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA
FEBRUARY 2000
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
FEBRUARY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.5 1.4 2.3
-.8 2 -.2 .8 .6 .9 1.0 .9 -.1
.9 1.1 .5 .6 .1 .0 -.3 -.1 .5 .2 .2 1.0 .7 1.0 1.0 .9 .0 .6 .1 .2 .2 1.5 -.6 .4 .1 .3 .3 .8 .5 1.5 .4 2.3 1.5
.7 1.0 .3 1.0 .8 .6 .3 -.2 .4 .5 1.2 .3 .6 1.0 .8 .4 .7 .5 .0 1.0 1.8 1.8 3.3 18.5 1.7 1.6 2.6 1.6 -.3 .8 .6 .5 .4 .7 -.2
-.1 -.1 1.5 1.7 1.1 .7 .9 .8 .8 .6 .8 1.3 1.5 .8 1.5 1.3 1.0 .8 1.5 2.5 4.0 3.9 3.5 17.4 -1.5 -1.9 -.4 -.6 1.0 .4 1.3 .4 -.3
.7 -.2 .2 1.1 .5 .7 1.2 .7 .9 1.0 .6 .9 1.2 .7 -.1 1.2 1.6 .5 -.2 .1 -1.5 2.0 1.4 1.0 1.2 2.7 1.9 .4 1.4 .2 1.2 .0 .5 .5
2.8 2.5 1.4 .7 .0 .3 1.1 .3 1.1 .9 1.0 1.3 1.3 1.0 .9 .3 2.1 1.2 2.5 -.5 1.2 .9 .5 -.6 3.0 1.9 .5 .5 .5 1.2 1.6 1.3 2.0 1.0 .7
2.7 1.5 1.0 .9 -2.6 -2.0 .5 1.8 1.3 1.5 3.4 1.2 1.3 1.1 .8 .2 .3 .3 -.2 -.5 -.4 -.3 .5 3.3 1.4 3.1 1.7 1.5
2.1 2.1 2.0 1.2 1.9 5.1 2.4 3.9 3.9 .5 -.7 .9 1.7 1.0 -.2 -.1 4.4 .4 -.2 1.1 -.8
1.8 1.8 1.7 1.8 2.1 1.7 2.3 1.3 2.8 .1 2.0 .0 -2.8 .4 .8 -1.2 .9 -.5 .5 -.1 1.0
2.1 .6 1.4 .2 1.3 .1 .9 -.6 .7 .8 2.4 1.7 -1.5 .1 1.0 .9 1.1 1.5 .3 1.1
1.7 1.0 1.9 1.7 1.7 3.1 .6 -.5 1.7 1.7 .9 .5 1.2 1.3 1.7 2.0 .5 .5 .8 .2 1.0 .8 1.1 1.5
.8 1.4 -.4 1.7 .9 .8 .3 1.1 .7 .3 -.8 -.2 2.0 1.2 .6 -.2 .8 1.0 .3 .6 .6 .6
1.4 2.1 -.1 -.2 -.8 2.2 .7 1.7 -.1 -.5 -.7 .4
1.2 1.9 4.6

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
FEBRUARY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


10 6 9
10 6 6 6 6 7 8 7 7
5 6 6 6 6 6 6 5 6 6 6 6 6 7 8 8 7 7 6 7 7 6 5 5 4 5 4 4 3 6 5
6 7 8 6 6 6 6 5 6 8 5 6 7 10 11 10 9 8 8 9 9 11 11 27 7 5 5 6 3 4 4 4 6 5 5
11 11 11 11 11 8 7 7 7 7 9 10 10 9 8 7 7 6 7 9 13 13 14 30 4 4 7 5 6 6 5 9 8
8 11 12 11 12 9 7 7 7 8 7 7 8 8 9 8 8 9 11 6 10 7 10 6 9 6 5 7 7 7 8 9
8 10 8 9 9 8 7 7 6 6 6 6 8 8 8 8 10 9 12 8 6 9 8 9 7 5 8 5 6 8 10 8 7 7
9 8 7 9 8 8 7 7 6 7 9 10 10 10 9 9 9 7 6 6 6 6 6 9 6 7 7 8
8 9 7 8 8 16 8 8 9 8 10 9 8 9 9 13 16 8 6 6 8 5
7 7 7 7 9 7 8 7 7 7 13 7 9 9 8 8 6 6 5 5 6
8 6 6 6 7 5 6 5 5 11 8 8 7 6 6 6 6 6 7 5
7 8 6 6 8 8 6 6 8 6 7 8 8 7 6 6 7 5 5 5 5 5 7 7
7 6 8 10 8 6 8 6 6 7 8 6 6 6 7 8 5 6 6 5 6 7
7 10 5 5 5 13 9 7 8 8 7 7
9 7 11

## TABLE 5

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.

**Area monitored** :90°N - 90°S, 180°W - 180°E.

**Standard of comparison** :Background field from UKMO global model.

**Observation times** :00 UTC and 12 UTC.

**Level(s) monitored** :Standard levels between 1000.0 - 30.0 hPa

**Element monitored** :GEOPOTENTIAL HEIGHT IN metres

**Parameters monitored** :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown duringperiod.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

**GROSS ERROR LIMITS** :Defined in Appendix I.1

**SELECTION CRITERIA** : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

**ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS**

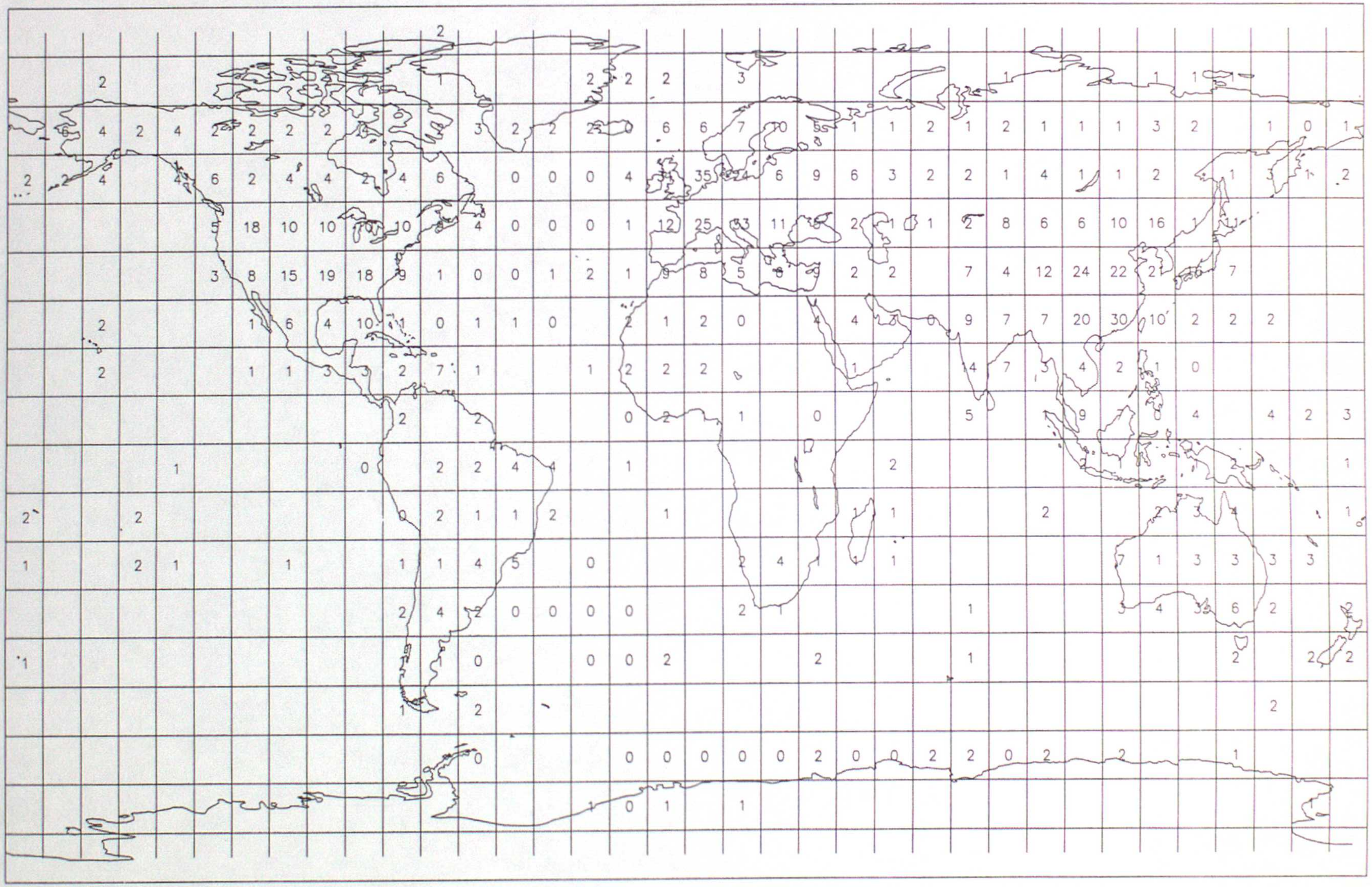
| WMO IDENT | OBS TIME | ELM | LEV | LAT/LONG | NUM OBS | NUM GROSS | SD | BIAS | RMS | NUM LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|
| 33658 | 00 | Z | 100 | 48/ 26 | 13 | 0 | 31.6 | 119.5 | 123.7 | 4 |
| 42027 | 12 | Z | 1000 | 34/ 75 | 13 | 0 | 16.4 | -41.1 | 44.2 | 6 |
| 42101 | 00 | Z | 200 | 30/ 76 | 23 | 0 | 55.0 | -70.4 | 89.3 | 5 |
| 42339 | 00 | Z | 300 | 26/ 73 | 15 | 0 | 74.7 | 33.1 | 81.7 | 4 |
| 42647 | 00 | Z | 200 | 23/ 73 | 16 | 1 | 103.9 | 17.3 | 105.3 | 6 |
| 42647 | 12 | Z | 300 | 23/ 73 | 19 | 0 | 57.9 | 61.3 | 84.3 | 6 |
| 43003 | 12 | Z | 100 | 19/ 73 | 4 | 11 | 12.0 | 280.7 | 281.0 | 7 |
| 43041 | 12 | Z | 100 | 19/ 82 | 12 | 0 | 94.0 | 82.3 | 124.9 | 5 |
| 43128 | 12 | Z | 100 | 17/ 78 | 27 | 0 | 80.9 | 106.4 | 133.7 | 4 |
| 43150 | 00 | Z | 200 | 18/ 83 | 27 | 0 | 52.0 | -67.1 | 84.9 | 4 |
| 43369 | 00 | Z | 200 | 8/ 73 | 24 | 0 | 97.3 | -19.4 | 99.2 | 4 |
| 43369 | 12 | Z | 100 | 8/ 73 | 10 | 0 | 73.5 | 99.6 | 123.8 | 4 |
| 56739 | 00 | Z | 1000 | 25/ 98 | 12 | 16 | 7.3 | 87.6 | 87.9 | 5 |
| 56739 | 12 | Z | 1000 | 25/ 98 | 27 | 0 | 12.0 | 68.9 | 69.9 | 5 |
| 72376 | 12 | Z | 1000 | 37/-108 | 28 | 0 | 23.1 | 34.4 | 41.4 | 5 |
| 91366 | 00 | Z | 100 | 9/ 168 | 24 | 0 | 50.3 | 142.7 | 151.3 | 4 |

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – FEBRUARY 2000 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1140



## TABLE 6

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for radiosonde TEMPs.

**Area monitored** :90°N - 90°S, 180°W - 180°E.

**Standard of comparison** :Background field from UKMO global model.

**Observation times** :00 UTC and 12 UTC.

**Level(s) monitored** :Standard levels between 1000.0 - 100.0 hPa

**Element monitored** :VECTOR WIND in m $s^{-1}$

**Parameters monitored**

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

**GROSS ERROR LIMITS** :Defined in Appendix I.2

**SELECTION CRITERIA** : ≥ 10 observations and ≥ 15 m $s^{-1}$ RMS vector wind.

**ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN**

| WMO IDENT | OBS TIME | ELM | LEV | LAT/LONG | NUM OBS | NUM GROSS | % REJ | UBIAS | VBIAS | RMS | LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSPIU | 12 | V | 150 | -5/ -81 | 27 | 0 | 40 | 8.0 | 4.7 | 24.7 | 2 |
| 17351 | 00 | V | 200 | 37/ 35 | 26 | 0 | 100 | -17.4 | 4.7 | 20.7 | 1 |
| 42182 | 12 | V | 300 | 29/ 77 | 24 | 0 | 54 | 0.9 | 0.6 | 19.9 | 1 |
| 42369 | 00 | V | 250 | 27/ 81 | 18 | 0 | 100 | -19.7 | -4.2 | 23.2 | 4 |
| 42369 | 12 | V | 300 | 27/ 81 | 17 | 0 | 100 | -19.4 | 1.0 | 22.4 | 2 |
| 42397 | 00 | V | 250 | 27/ 88 | 16 | 0 | 25 | -16.9 | -10.5 | 22.4 | 3 |
| 42397 | 12 | V | 300 | 27/ 88 | 11 | 0 | 36 | -13.0 | -4.5 | 17.4 | 1 |
| 42410 | 12 | V | 300 | 26/ 92 | 12 | 0 | 100 | -20.1 | -0.6 | 25.3 | 2 |
| 47881 | 00 | V | 100 | 34/ 135 | 10 | 0 | 10 | -8.7 | 2.2 | 18.8 | 1 |
| 47981 | 00 | V | 150 | 25/ 141 | 10 | 0 | 10 | 7.9 | -2.0 | 16.1 | 1 |
| 48855 | 00 | V | 150 | 16/ 108 | 28 | 1 | 50 | 0.6 | 23.5 | 27.3 | 1 |
| 58203 | 00 | V | 100 | 33/ 116 | 28 | 0 | 14 | 1.7 | 4.0 | 16.3 | 1 |
| 60620 | 12 | V | 200 | 28/ 0 | 13 | 0 | 100 | -21.3 | -2.3 | 27.7 | 2 |
| 62378 | 00 | V | 150 | 30/ 31 | 26 | 0 | 57 | -1.4 | -2.5 | 15.7 | 1 |
| 78486 | 12 | V | 200 | 18/ -70 | 11 | 0 | 45 | 0.1 | -6.3 | 19.7 | 1 |

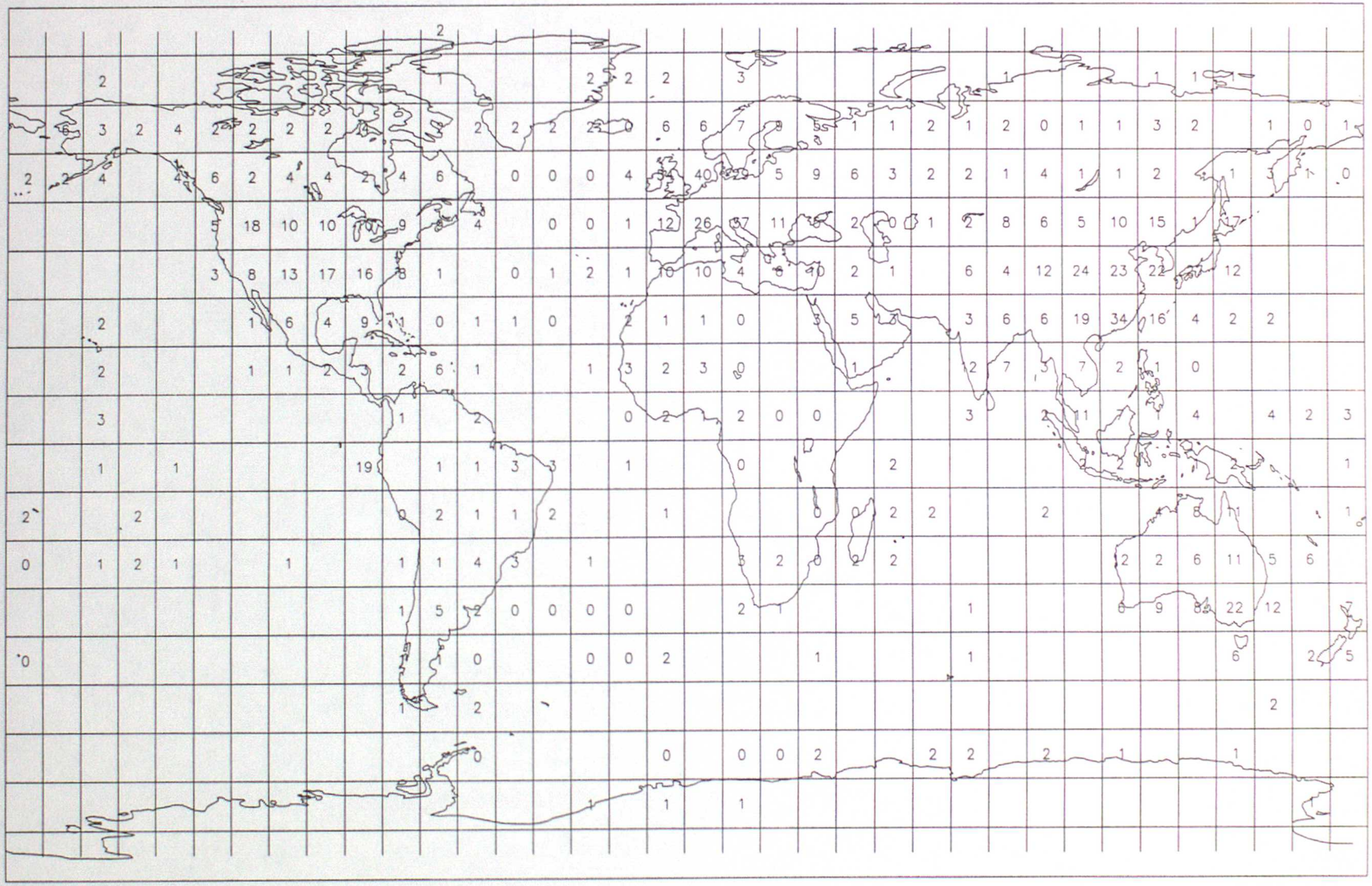
AVAILABILITY - TEMP/PILOT - 300 HPA WIND - FEBRUARY 2000

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1294


2
2 1 2 2 2 3 1 1 1 1
6 3 2 4 2 2 2 2 3 2 2 2 2 0 6 6 7 9 5 1 1 2 1 2 0 1 1 3 2 1 0 1
2 2 4 4 6 2 4 4 2 4 6 0 0 0 4 4 40 9 5 9 6 3 2 2 1 4 1 1 2 1 3 1 0
5 18 10 10 9 4 0 0 1 12 26 37 11 2 0 1 2 8 6 5 10 15 1 7
3 8 13 17 16 8 1 0 1 2 1 10 10 4 6 10 2 1 6 4 12 24 23 22 12
2 1 6 4 9 1 0 1 1 0 2 1 1 0 3 5 2 3 6 6 19 34 16 4 2 2
2 1 1 2 3 2 6 1 1 3 2 3 0 1 2 7 3 7 2 1 0
3 1 2 0 2 2 0 0 3 2 11 7 4 4 2 3
1 1 19 1 1 3 3 1 0 2 2 2 1
2 2 0 2 1 1 2 1 0 0 2 2 2 8 1 1
0 1 2 1 1 1 1 4 3 1 3 2 0 2 2 2 2 6 11 5 6
1 5 2 0 0 0 0 2 1 1 0 9 8 22 12 7
0 1 0 0 0 2 1 1 6 2 5
1 2 2
0 0 0 0 2 2 2 2 1 1
1 1 1

# TABLE 7

# MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for radiosonde TEMPs. |
| **Area monitored** | | :90°N - 90°S, 180°W - 180°E. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00 UTC and 12 UTC. |
| **Level(s) monitored** | | :Standard levels between 500.0 - 150.0 hPa |
| **Element monitored** | | :WIND DIRECTION in degrees |
| **Parameters monitored** | | |
| | :NUM OBS | :Average number of observations at all levels. |
| | :BIAS | :Mean difference of observations from background values from all levels. |
| | :MAX SPREAD | :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels |
| | :SD | :SD of difference of observations from background values at all levels. |

**SELECTION CRITERIA**

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

| WMO IDENT | OBS TIME | ELM | LAT/LONG | NUM OBS | BIAS | MAX SPREAD | SD |
|---|---|---|---|---|---|---|---|
| 17280 | 00 | DD | 38/ 40 | 26 | -13.9 | 2.9 | 9.1 |
| 17351 | 00 | DD | 37/ 35 | 25 | -27.2 | 6.7 | 13.4 |
| 42397 | 12 | DD | 27/ 88 | 8 | 11.7 | 5.2 | 8.5 |
| 60571 | 12 | DD | 32/ -2 | 21 | 26.2 | 3.9 | 18.4 |
| 62337 | 12 | DD | 31/ 34 | 21 | -19.3 | 5.6 | 7.9 |
| 68842 | 12 | DD | -34/ 26 | 10 | -14.4 | 6.9 | 20.4 |
| 78970 | 12 | DD | 11/ -61 | 22 | 24.6 | 5.9 | 22.6 |

# MONITORING OF SATELLITE WINDS

## MONITORING CENTRE: BRACKNELL

## MONTH: FEBRUARY 2000

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

**Standard of comparison** :Background field from UKMO global model.

**Selection Criteria** :number of observations > 10.

**Data Extracted** :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

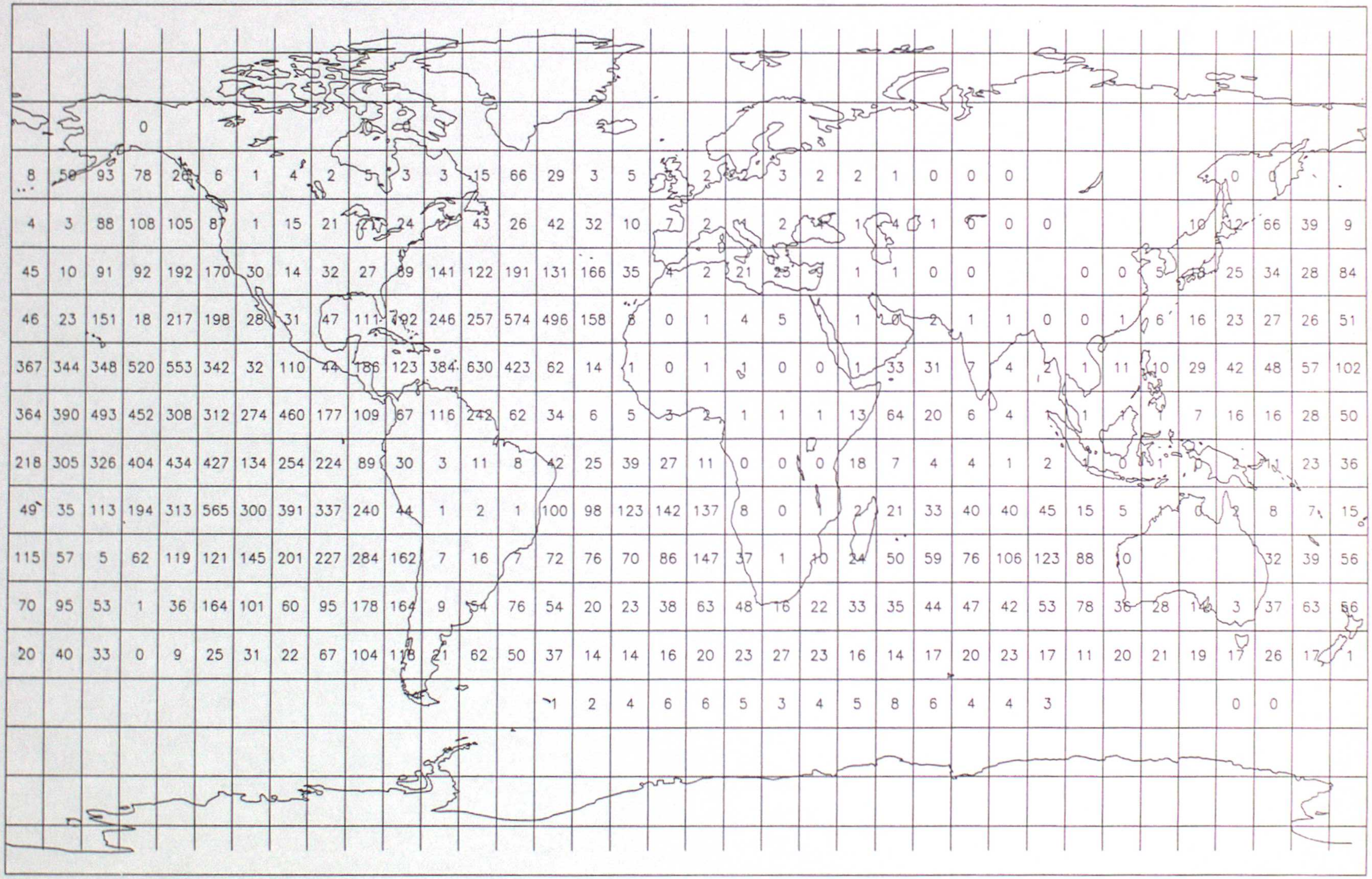
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
FEBRUARY 2000


0
8 58 93 78 26 6 1 4 2 5 3 3 15 66 29 3 5 3 2 2 3 2 2 1 0 0 0 0 0
4 3 88 108 105 87 1 15 21 21 24 43 26 42 32 10 7 2 4 2 4 1 4 1 0 0 0 10 12 66 39 9
45 10 91 92 192 170 30 14 32 27 89 141 122 191 131 166 35 4 2 21 25 9 1 1 0 0 0 0 5 18 25 34 28 84
46 23 151 18 217 198 28 31 47 111 192 246 257 574 496 158 8 0 1 4 5 1 1 0 2 1 1 0 0 1 6 16 23 27 26 51
367 344 348 520 553 342 32 110 44 186 123 384 630 423 62 14 1 0 1 1 0 0 1 33 31 7 4 2 1 11 10 29 42 48 57 102
364 390 493 452 308 312 274 460 177 109 67 116 242 62 34 6 5 3 2 1 1 1 13 64 20 6 4 1 1 1 1 7 16 16 28 50
218 305 326 404 434 427 134 254 224 89 30 3 11 8 42 25 39 27 11 0 0 0 18 7 4 4 1 2 1 0 1 0 2 11 23 36
49 35 113 194 313 565 300 391 337 240 44 1 2 1 100 98 123 142 137 8 0 1 2 21 33 40 40 45 15 5 1 0 2 8 7 15
115 57 5 62 119 121 145 201 227 284 162 7 16 7 72 76 70 86 147 37 1 10 24 50 59 76 106 123 88 10 32 39 56
70 95 53 1 36 164 101 60 95 178 164 9 54 76 54 20 23 38 63 48 16 22 33 35 44 47 42 53 78 36 28 14 3 37 63 56
20 40 33 0 9 25 31 22 67 104 118 21 62 50 37 14 14 16 20 23 27 23 16 14 17 20 23 17 11 20 21 19 17 26 17 1
1 2 4 6 6 5 3 4 5 8 6 4 4 3 0 0

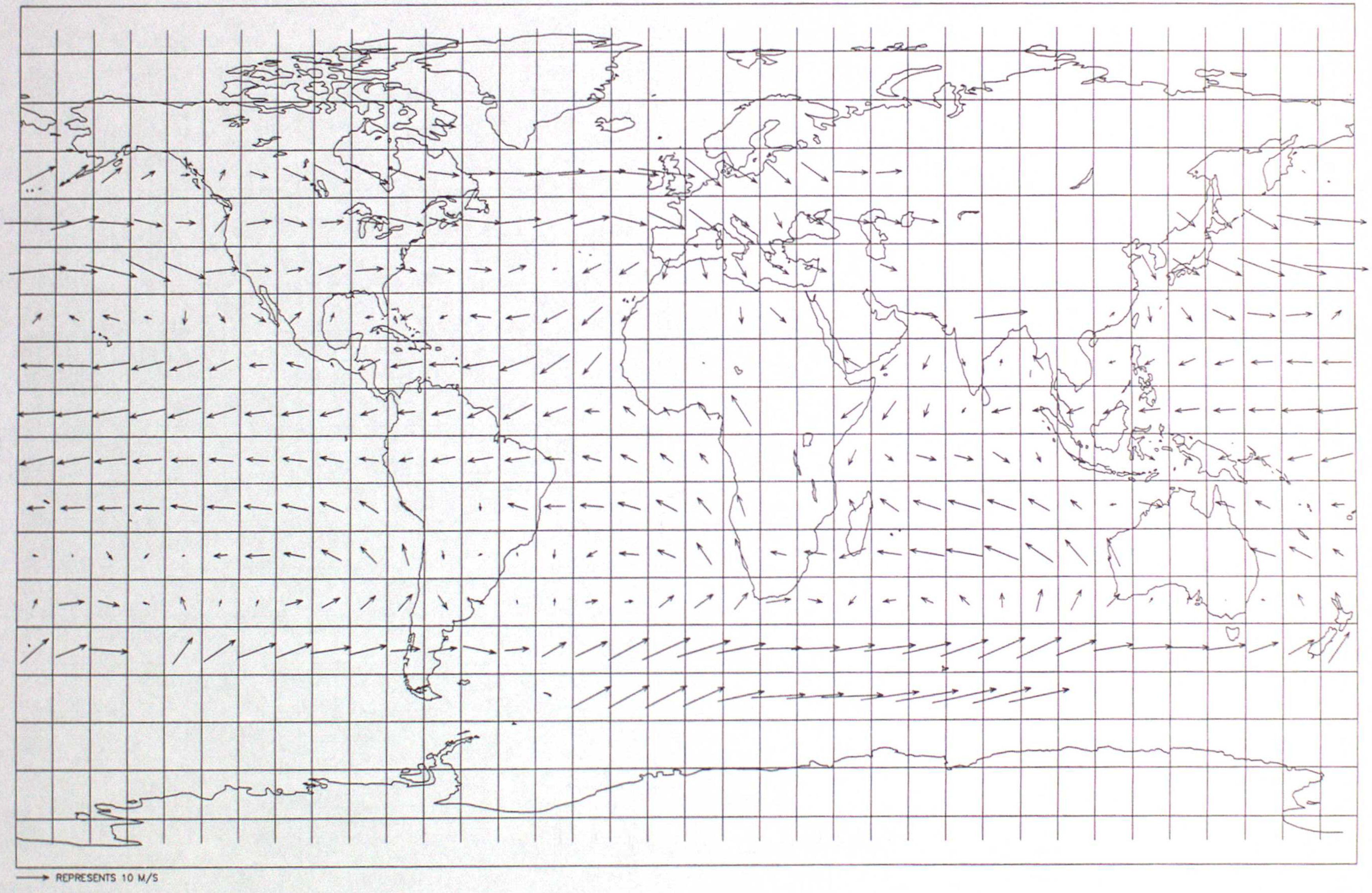
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

FIGURE 11

FEBRUARY 2000

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

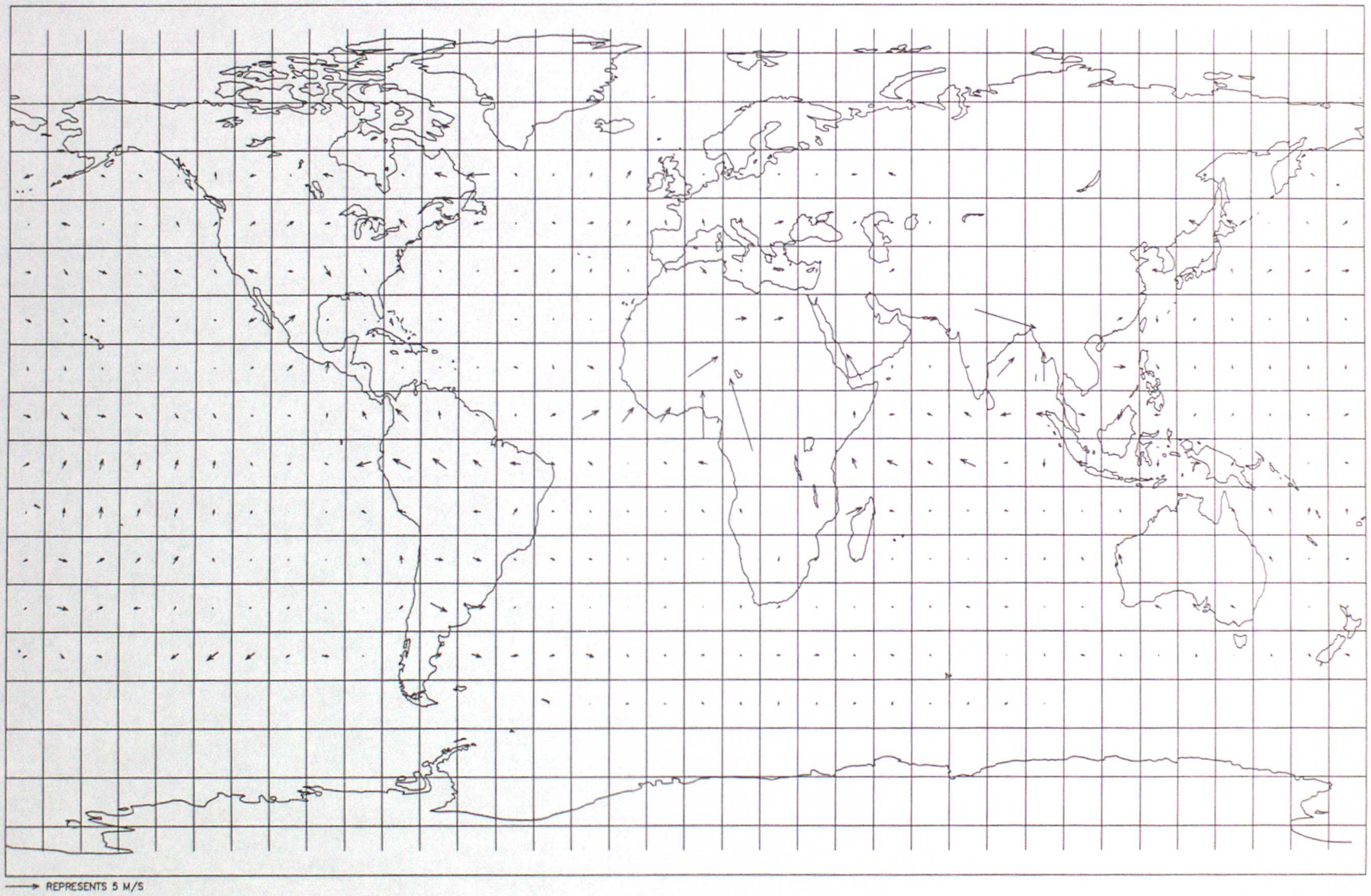
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

FEBRUARY 2000

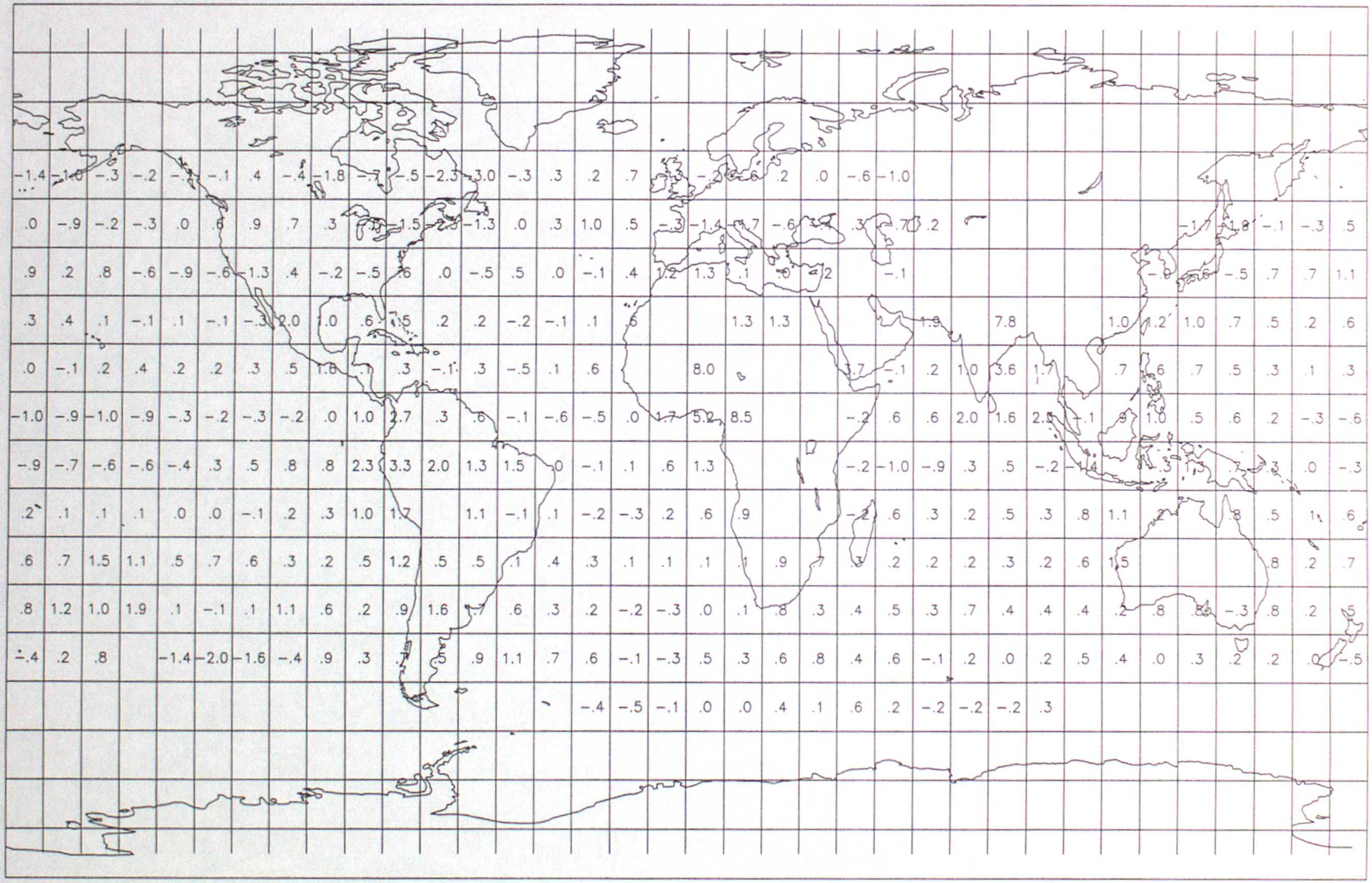
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

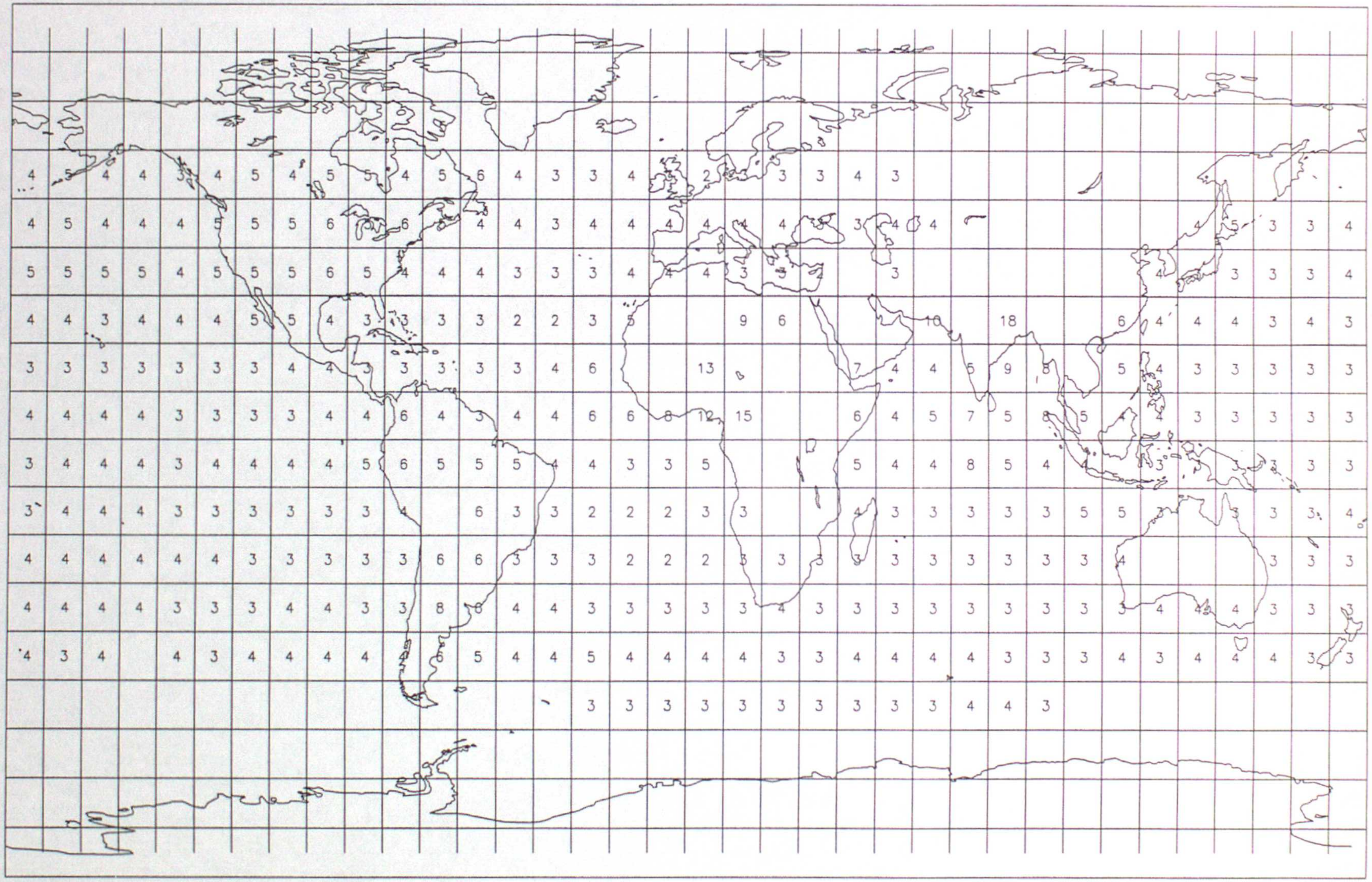
FIGURE 12



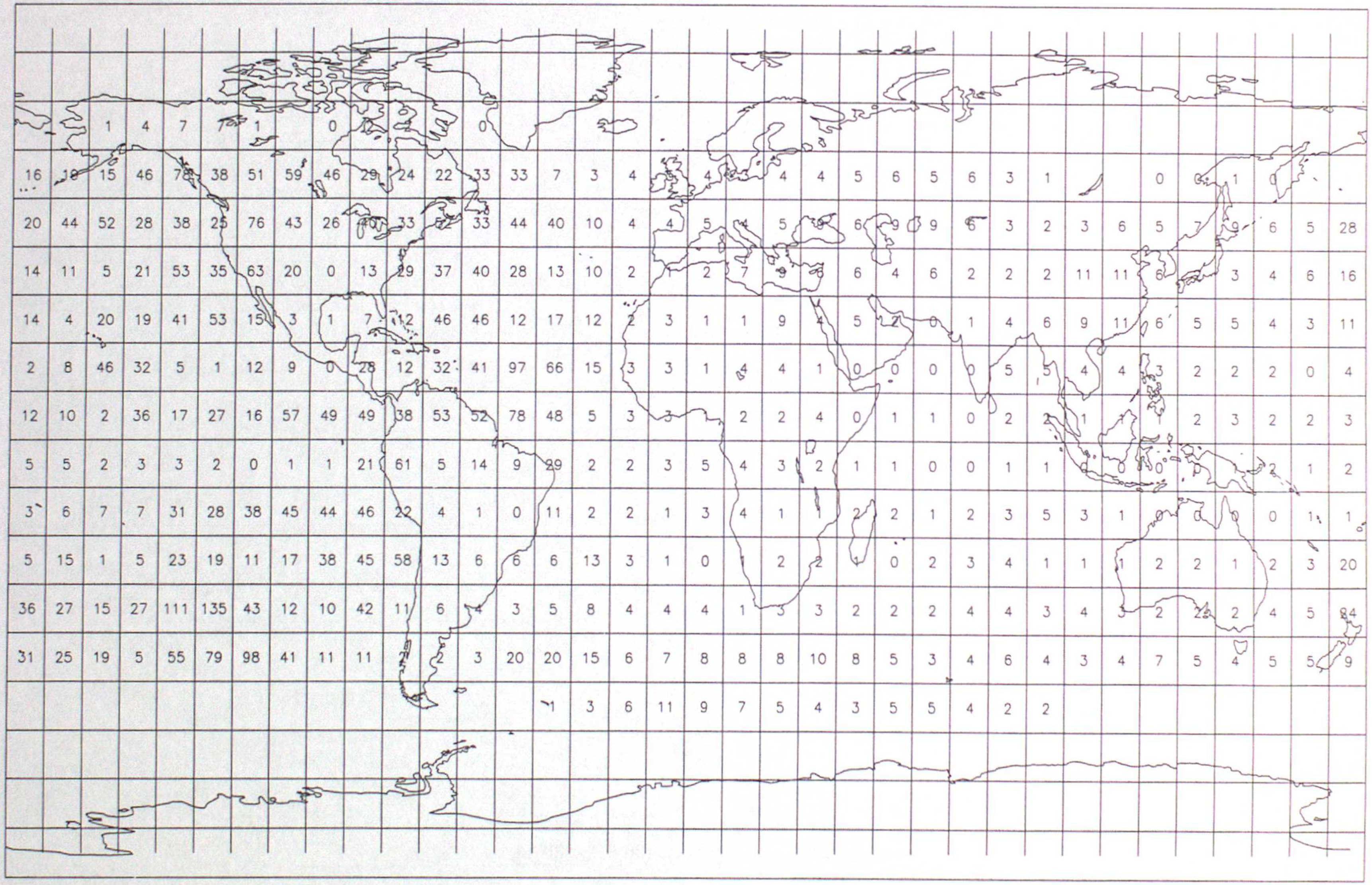
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
FEBRUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.4 -1.0 -.3 -.2 -.1 .4 -.4 -1.8 -.7 -.5 -2.3 -3.0 -.3 .3 .2 .7 -.2 .6 .2 .0 -.6 -1.0
.0 -.9 -.2 -.3 .0 .6 .9 .7 .3 .7 -1.5 -2.3 -1.3 .0 .3 1.0 .5 -.3 -1.4 .7 -.6 .3 .3 -.7 .2 -1.7 -1.8 -.1 -.3 .5
.9 .2 .8 -.6 -.9 -.6 -1.3 .4 -.2 -.5 .6 .0 -.5 .5 .0 -.1 .4 1.2 1.3 .1 .0 .2 -.1 -.9 .6 -.5 .7 .7 1.1
.3 .4 .1 -.1 .1 -.1 -.3 2.0 1.0 .6 .5 .2 .2 -.2 -.1 .1 .6 1.3 1.3 1.9 7.8 1.0 1.2 1.0 .7 .5 .2 .6
.0 -.1 .2 .4 .2 .2 .3 .5 1.6 .1 .3 -.1 .3 -.5 .1 .6 8.0 .7 -.1 .2 1.0 3.6 1.7 .7 .6 .7 .5 .3 .1 .3
-1.0 -.9 -1.0 -.9 -.3 -.2 -.3 -.2 .0 1.0 2.7 .3 .6 -.1 -.6 -.5 .0 1.7 5.2 8.5 -.2 .6 .6 2.0 1.6 2.5 -.1 .9 1.0 .5 .6 .2 -.3 -.6
-.9 -.7 -.6 -.6 -.4 .3 .5 .8 .8 2.3 3.3 2.0 1.3 1.5 .0 -.1 .1 .6 1.3 -.2 -1.0 -.9 .3 .5 -.2 -1.4 .3 1.3 .3 .0 -.3
.2 .1 .1 .1 .0 .0 -.1 .2 .3 1.0 1.7 1.1 -.1 .1 -.2 -.3 .2 .6 .9 -.2 .6 .3 .2 .5 .3 .8 1.1 .2 .8 .5 1 .6
.6 .7 1.5 1.1 .5 .7 .6 .3 .2 .5 1.2 .5 .5 .1 .4 .3 .1 .1 .1 .1 .9 .7 .3 .2 .2 .2 .3 .2 .6 1.5 .8 .2 .7
.8 1.2 1.0 1.9 .1 -.1 .1 1.1 .6 .2 .9 1.6 .7 .6 .3 .2 -.2 -.3 .0 .1 .8 .3 .4 .5 .3 .7 .4 .4 .4 .2 .8 .8 -.3 .8 .2 .5
-.4 .2 .8 -1.4 -2.0 -1.6 -.4 .9 .3 .7 .5 .9 1.1 .7 .6 -.1 -.3 .5 .3 .6 .8 .4 .6 -.1 .2 .0 .2 .5 .4 .0 .3 .2 .2 .0 -.5
-.4 -.5 -.1 .0 .0 .4 .1 .6 .2 -.2 -.2 -.2 .3

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
FEBRUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

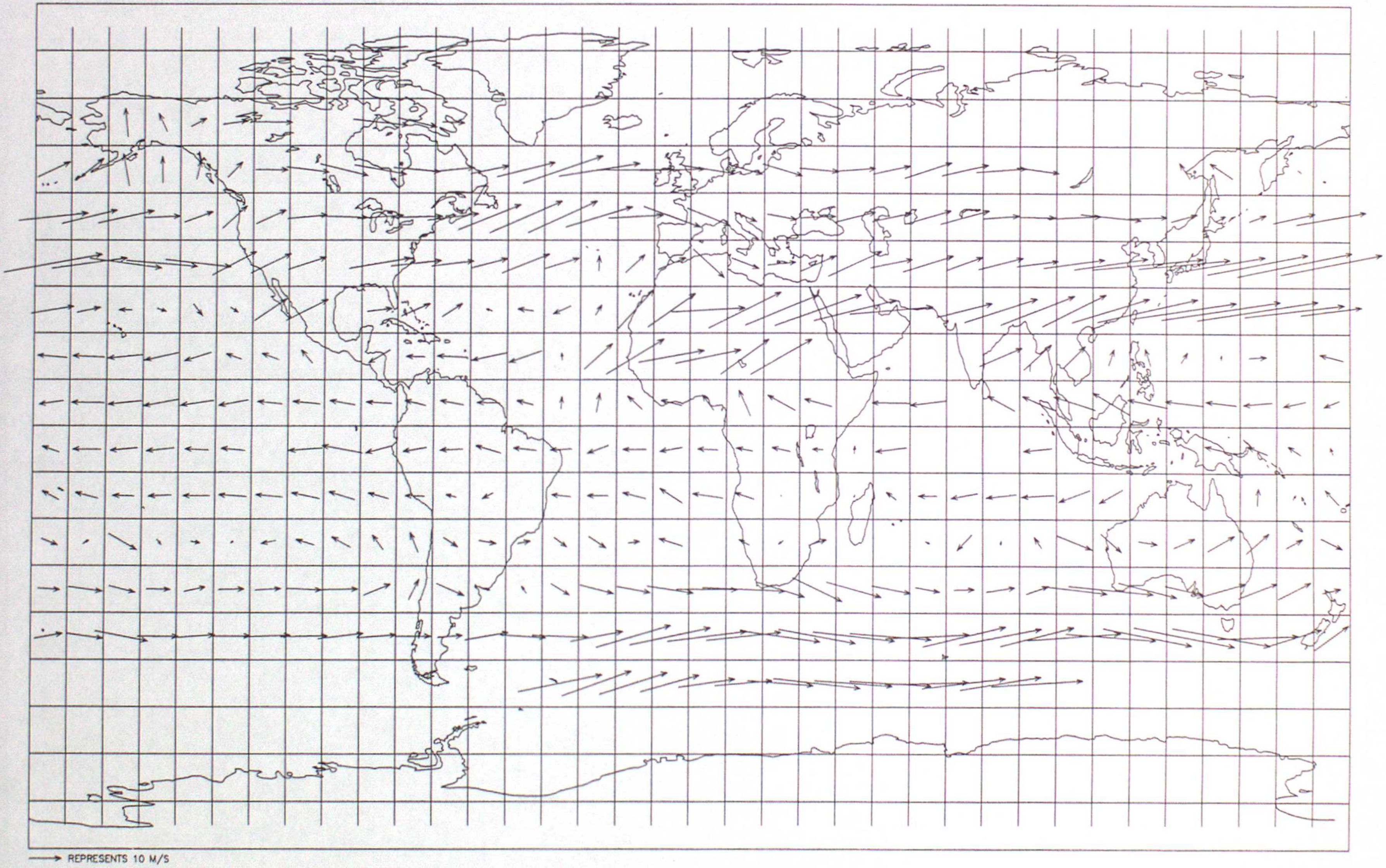

4 5 4 4 3 4 5 4 5 5 4 5 6 4 3 3 4 2 3 3 4 3
4 5 4 4 4 5 5 5 6 6 4 4 3 4 4 4 4 4 4 3 3 4 4 4 5 3 3 4
5 5 5 5 4 5 5 5 6 5 4 4 4 3 3 3 4 4 4 3 3 4 3 4 3 3 3 4
4 4 3 4 4 4 5 5 4 3 3 3 3 2 2 3 5 9 6 10 18 6 4 4 4 3 4 3
3 3 3 3 3 3 3 4 4 3 3 3 3 3 4 6 13 7 4 4 5 9 8 5 4 3 3 3 3 3
4 4 4 4 3 3 3 3 4 4 6 4 3 4 4 6 6 8 12 15 6 4 5 7 5 8 5 4 4 3 3 3 3 3
3 4 4 4 3 4 4 4 4 5 6 5 5 5 4 4 3 3 5 5 4 4 8 5 4 4 3 3 3 3 3 3
3 4 4 4 3 3 3 3 3 3 4 6 3 3 2 2 2 3 3 4 3 3 3 3 3 5 5 3 3 3 3 4
4 4 4 4 4 4 3 3 3 3 3 6 6 3 3 3 2 2 2 3 3 3 3 3 3 3 3 3 3 4 3 3 3
4 4 4 4 3 3 3 4 4 3 3 8 8 4 4 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 4 4 4 3 3 3
4 3 4 4 3 4 4 4 4 4 6 5 4 4 5 4 4 4 4 3 3 4 4 4 4 3 3 3 4 3 4 4 4 3 3
3 3 3 3 3 3 3 3 3 3 3 4 4 3

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
FEBRUARY 2000


1 4 7 7 1 0 0
16 18 15 46 78 38 51 59 46 29 24 22 33 33 7 3 4 5 4 4 4 5 6 5 6 3 1 0 0 1 0
20 44 52 28 38 25 76 43 26 40 33 52 33 44 40 10 4 4 5 4 5 6 6 9 9 6 3 2 3 6 5 7 9 6 5 28
14 11 5 21 53 35 63 20 0 13 29 37 40 28 13 10 2 1 2 7 9 6 6 4 6 2 2 2 11 11 6 3 4 6 16
14 4 20 19 41 53 15 3 1 7 12 46 46 12 17 12 2 3 1 1 9 4 5 2 0 1 4 6 9 11 6 5 5 4 3 11
2 8 46 32 5 1 12 9 0 28 12 32 41 97 66 15 3 3 1 4 4 1 0 0 0 0 5 5 4 4 3 2 2 2 0 4
12 10 2 36 17 27 16 57 49 49 38 53 52 78 48 5 3 3 1 2 2 4 0 1 1 0 2 2 1 1 1 2 3 2 2 3
5 5 2 3 3 2 0 1 1 21 61 5 14 9 29 2 2 3 5 4 3 2 1 1 0 0 1 1 0 0 0 0 1 2 1 2
3 6 7 7 31 28 38 45 44 46 22 4 1 0 11 2 2 1 3 4 1 1 2 2 1 2 3 5 3 1 0 0 0 0 1 1
5 15 1 5 23 19 11 17 38 45 58 13 6 6 6 13 3 1 0 1 2 2 1 0 2 3 4 1 1 1 2 2 1 2 3 20
36 27 15 27 111 135 43 12 10 42 11 6 4 3 5 8 4 4 4 1 3 3 2 2 2 4 4 3 4 3 2 2 2 4 5 84
31 25 19 5 55 79 98 41 11 11 2 2 3 20 20 15 6 7 8 8 8 10 8 5 3 4 6 4 3 4 7 5 4 5 5 9
1 3 6 11 9 7 5 4 3 5 5 4 2 2

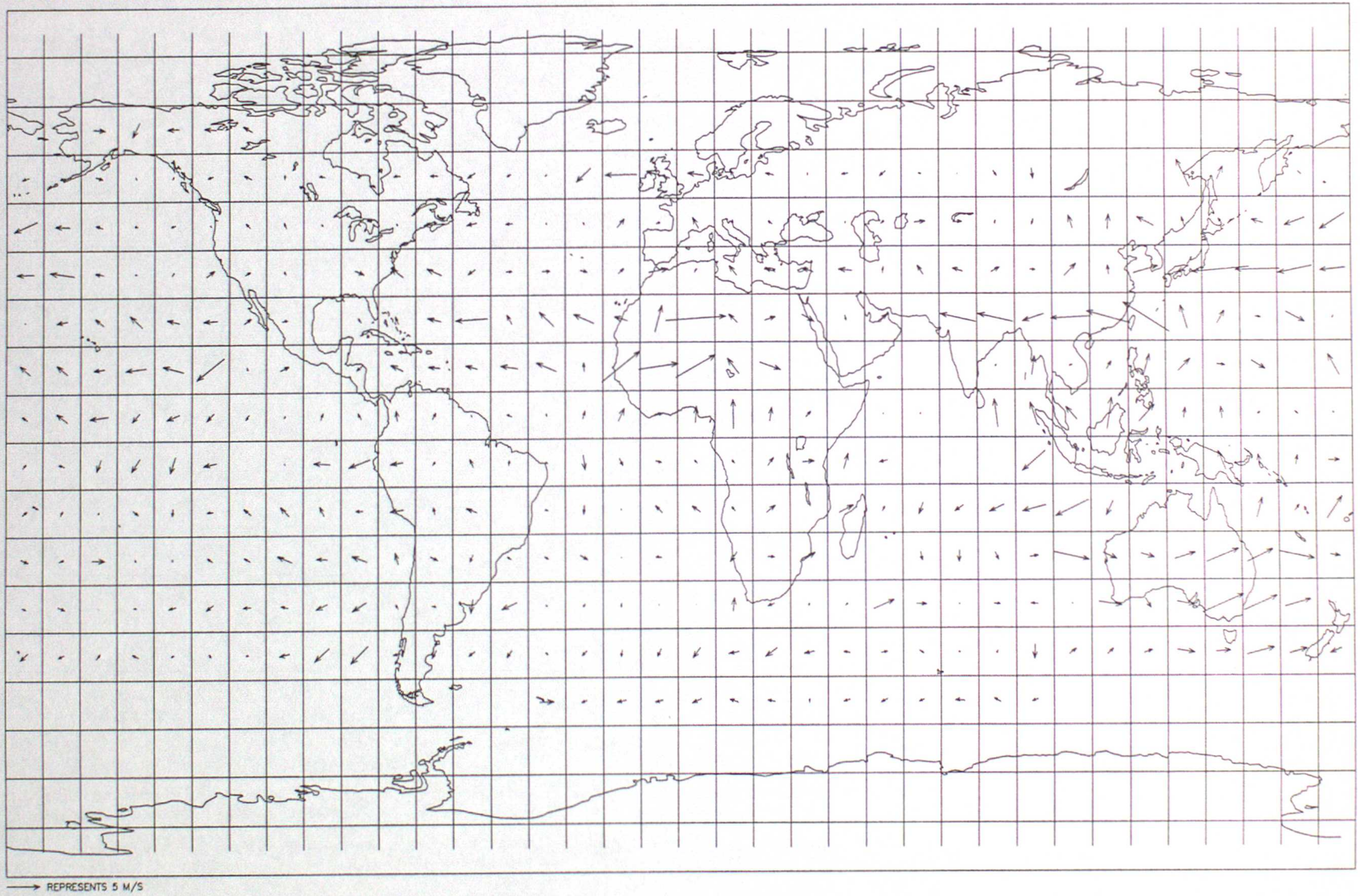
SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
FEBRUARY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

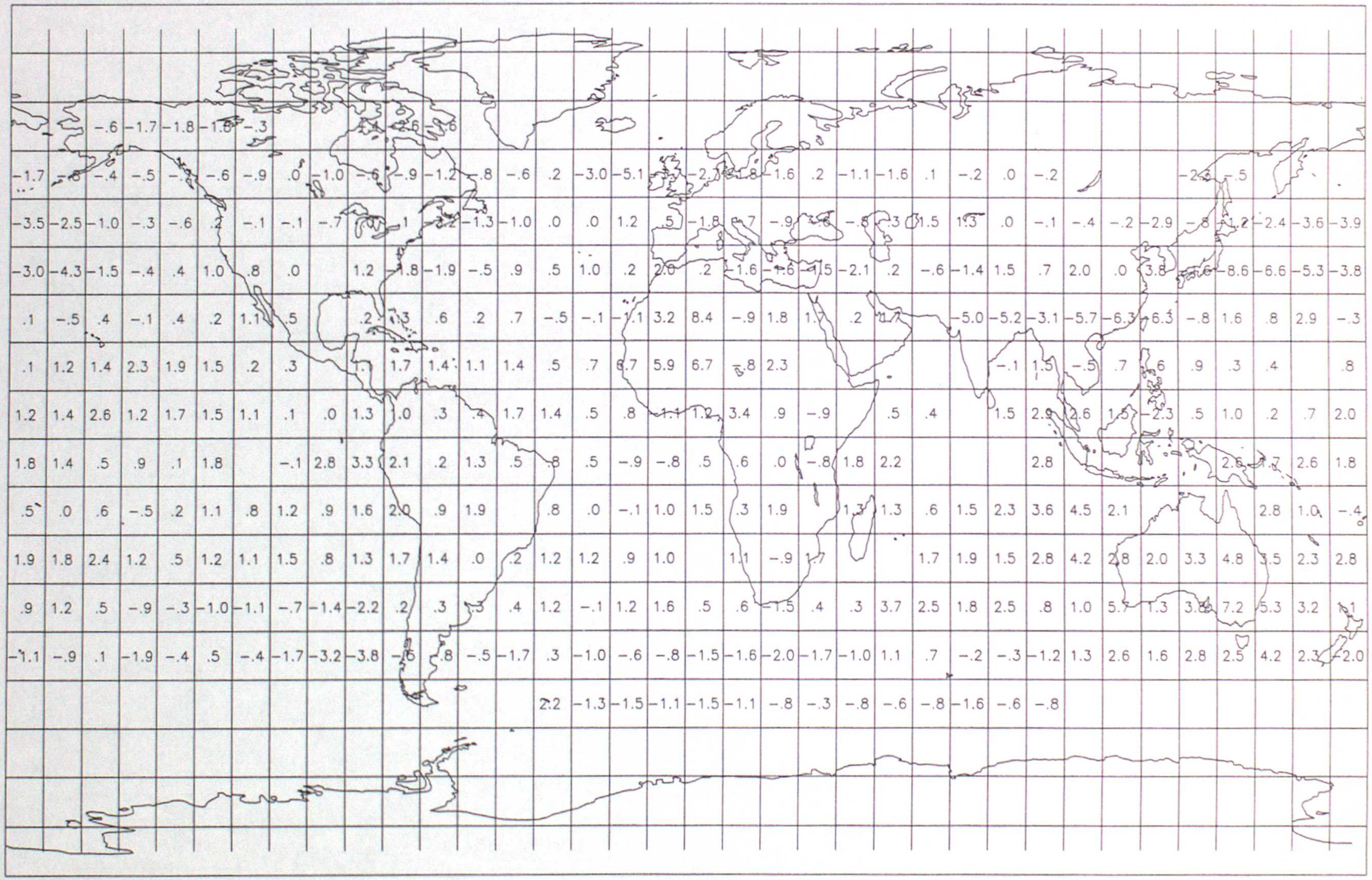

→ REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
FEBRUARY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

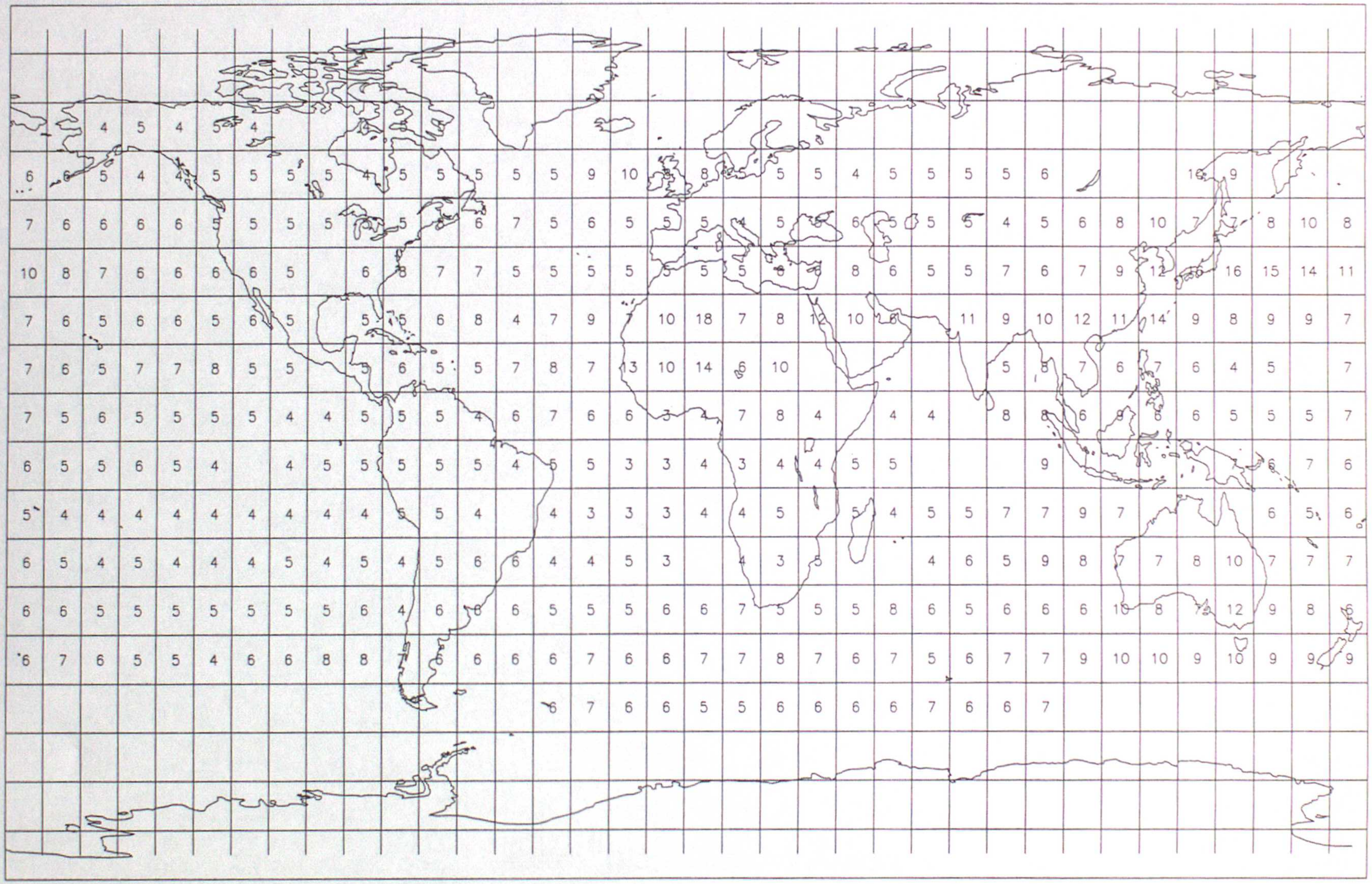
FIGURE 17



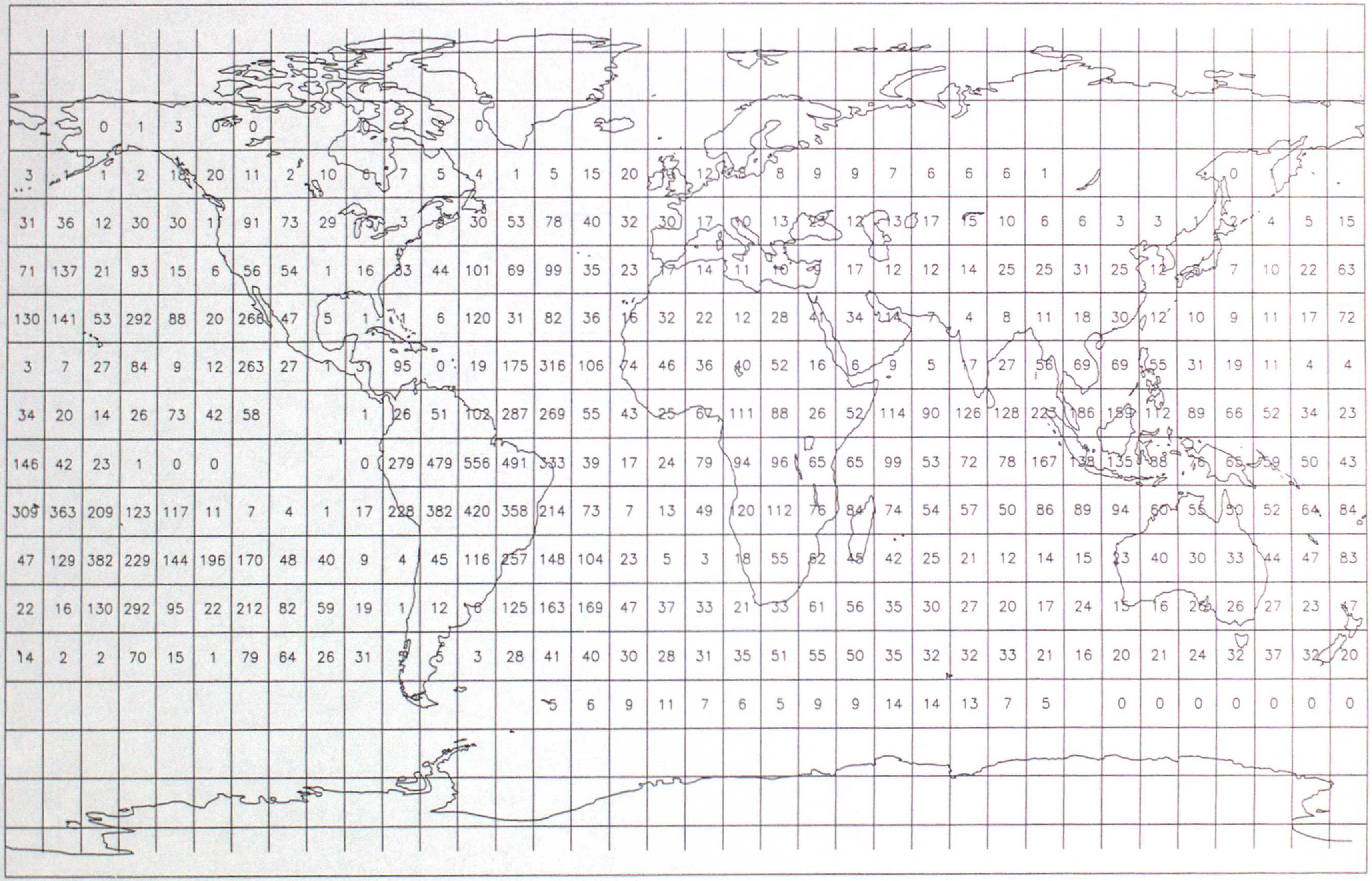
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
FEBRUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-.6 -1.7 -1.8 -1.8 -.3 -.4 -2.6 -.6
-1.7 -.8 -.4 -.5 -.2 -.6 -.9 .0 -1.0 -.6 -.9 -1.2 -.8 -.6 .2 -3.0 -5.1 -.3 -2.7 -1.8 -1.6 .2 -1.1 -1.6 .1 -.2 .0 -.2 -2.3 -.5
-3.5 -2.5 -1.0 -.3 -.6 .2 -.1 -.1 -.7 .0 .1 -3.2 -1.3 -1.0 .0 .0 1.2 .5 -1.8 -.7 -.9 -.6 -.8 -.3 1.5 1.3 .0 -.1 -.4 -.2 -2.9 -.8 -1.2 -2.4 -3.6 -3.9
-3.0 -4.3 -1.5 -.4 .4 1.0 .8 .0 1.2 -1.8 -1.9 -.5 .9 .5 1.0 .2 2.0 .2 -1.6 -1.6 -1.5 -2.1 .2 -.6 -1.4 1.5 .7 2.0 .0 3.8 -.6 -8.6 -6.6 -5.3 -3.8
.1 -.5 .4 -.1 .4 .2 1.1 .5 .2 -.3 .6 .2 .7 -.5 -.1 -1.1 3.2 8.4 -.9 1.8 1.7 .2 1.7 -5.0 -5.2 -3.1 -5.7 -6.3 -6.3 -.8 1.6 .8 2.9 -.3
.1 1.2 1.4 2.3 1.9 1.5 .2 .3 1.1 1.7 1.4 1.1 1.4 .5 .7 6.7 5.9 6.7 .8 2.3 -.1 1.5 -.5 .7 .6 .9 .3 .4 .8
1.2 1.4 2.6 1.2 1.7 1.5 1.1 .1 .0 1.3 1.0 .3 .4 1.7 1.4 .5 .8 1.1 1.2 3.4 .9 -.9 .5 .4 1.5 2.9 2.6 1.5 -2.3 .5 1.0 .2 .7 2.0
1.8 1.4 .5 .9 .1 1.8 -.1 2.8 3.3 2.1 .2 1.3 .5 .8 .5 -.9 -.8 .5 .6 .0 -.8 1.8 2.2 2.8 2.6 .7 2.6 1.8
.5 .0 .6 -.5 .2 1.1 .8 1.2 .9 1.6 2.0 .9 1.9 .8 .0 -.1 1.0 1.5 .3 1.9 1.3 1.3 .6 1.5 2.3 3.6 4.5 2.1 2.8 1.0 -.4
1.9 1.8 2.4 1.2 .5 1.2 1.1 1.5 .8 1.3 1.7 1.4 .0 .2 1.2 1.2 .9 1.0 1.1 -.9 1.7 1.7 1.9 1.5 2.8 4.2 2.8 2.0 3.3 4.8 3.5 2.3 2.8
.9 1.2 .5 -.9 -.3 -1.0 -1.1 -.7 -1.4 -2.2 .2 .3 .3 .4 1.2 -.1 1.2 1.6 .5 .6 -1.5 .4 .3 3.7 2.5 1.8 2.5 .8 1.0 5.7 1.3 3.6 7.2 5.3 3.2 1.1
-1.1 -.9 .1 -1.9 -.4 .5 -.4 -1.7 -3.2 -3.8 -.6 .8 -.5 -1.7 .3 -1.0 -.6 -.8 -1.5 -1.6 -2.0 -1.7 -1.0 1.1 .7 -.2 -.3 -1.2 1.3 2.6 1.6 2.8 2.5 4.2 2.3 -2.0
2.2 -1.3 -1.5 -1.1 -1.5 -1.1 -.8 -.3 -.8 -.6 -.8 -1.6 -.6 -.8

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
FEBRUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 5 4 5 4
6 6 5 4 4 5 5 5 5 4 5 5 5 5 5 9 10 8 8 5 5 5 4 5 5 5 5 6 16 9
7 6 6 6 6 5 5 5 5 5 5 8 6 7 5 6 5 5 5 4 5 5 6 5 5 5 4 5 6 8 10 7 7 8 10 8
10 8 7 6 6 6 6 5 6 8 7 7 5 5 5 5 5 5 5 6 6 8 6 5 5 7 6 7 9 12 16 16 15 14 11
7 6 5 6 6 5 6 5 5 5 6 8 4 7 9 7 10 18 7 8 12 10 6 11 9 10 12 11 14 9 8 9 9 7
7 6 5 7 7 8 5 5 5 6 5 5 7 8 7 13 10 14 6 10 5 8 7 6 7 6 4 5 7
7 5 6 5 5 5 5 4 4 5 5 5 4 6 7 6 6 3 4 7 8 4 4 4 8 8 6 9 6 6 5 5 5 7
6 5 5 6 5 4 4 5 5 5 5 5 4 5 5 3 3 4 3 4 4 5 5 9 6 7 6
5 4 4 4 4 4 4 4 4 4 5 5 4 4 3 3 3 4 4 5 5 4 5 5 7 7 9 7 6 5 6
6 5 4 5 4 4 4 5 4 5 4 5 6 6 4 4 5 3 4 3 5 4 6 5 9 8 7 7 8 10 7 7 7
6 6 5 5 5 5 5 5 5 6 4 6 6 6 5 5 5 6 6 7 5 5 5 8 6 5 6 6 6 10 8 7 12 9 8 6
6 7 6 5 5 4 6 6 8 8 7 6 6 6 6 7 6 6 7 7 8 7 6 7 5 6 7 7 9 10 10 9 10 9 9 9
6 7 6 6 5 5 6 6 6 6 7 6 6 7

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
FEBRUARY 2000

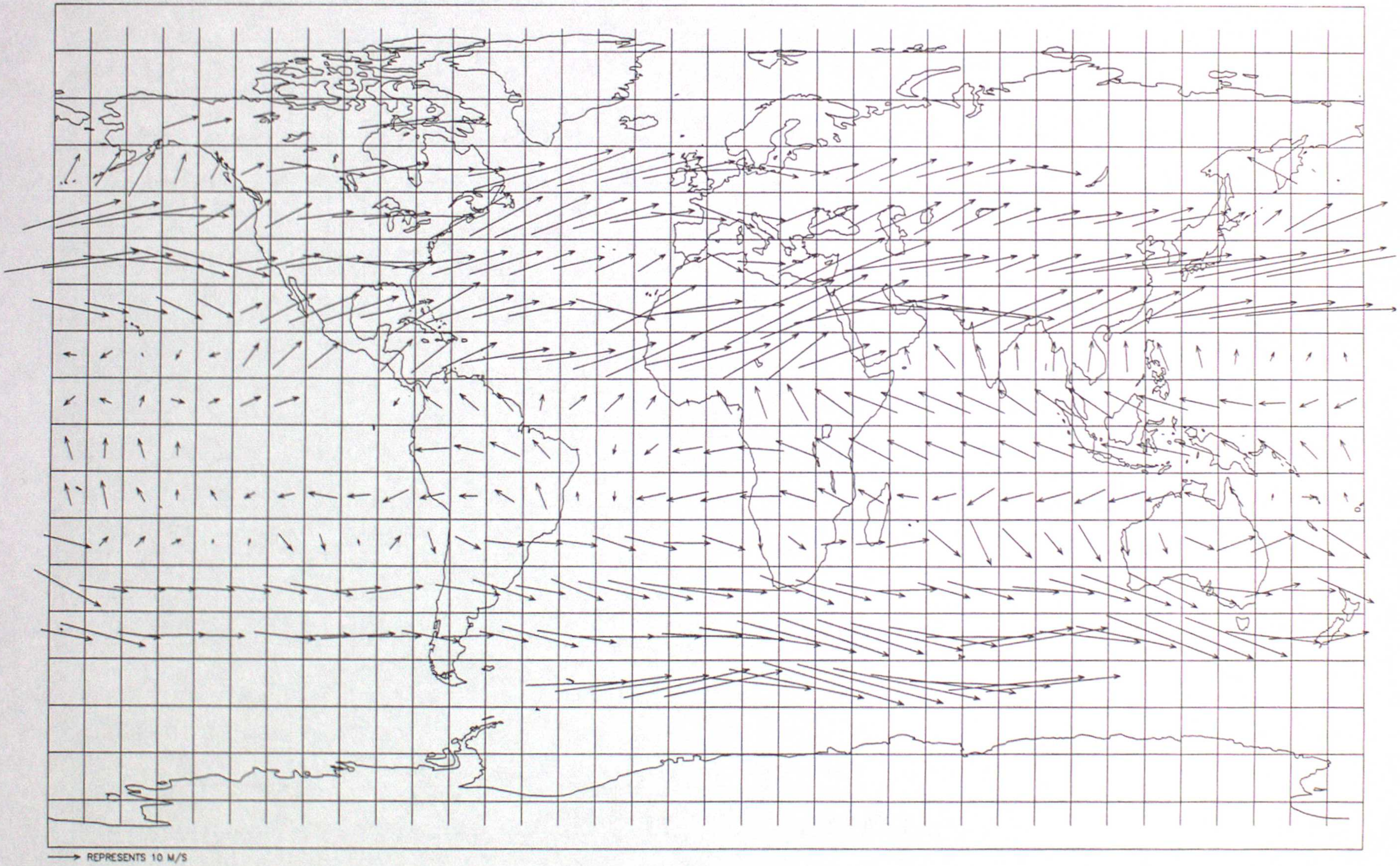


| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 3 | 0 | 0 | | | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 1 | 2 | 18 | 20 | 11 | 2 | 10 | 6 | 7 | 5 | 4 | 1 | 5 | 15 | 20 | [illegible] | 12 | 8 | 8 | 9 | 9 | 7 | 6 | 6 | 6 | 1 | | | | | 0 | | | |
| 31 | 36 | 12 | 30 | 30 | 11 | 91 | 73 | 29 | 15 | 3 | 8 | 30 | 53 | 78 | 40 | 32 | 30 | 17 | 10 | 13 | 23 | 12 | 13 | 17 | 15 | 10 | 6 | 6 | 3 | 3 | 1 | 2 | 4 | 5 | 15 |
| 71 | 137 | 21 | 93 | 15 | 6 | 56 | 54 | 1 | 16 | 33 | 44 | 101 | 69 | 99 | 35 | 23 | 17 | 14 | 11 | 10 | 9 | 17 | 12 | 12 | 14 | 25 | 25 | 31 | 25 | 12 | 8 | 7 | 10 | 22 | 63 |
| 130 | 141 | 53 | 292 | 88 | 20 | 268 | 47 | 5 | 1 | 1 | 6 | 120 | 31 | 82 | 36 | 16 | 32 | 22 | 12 | 28 | 41 | 34 | 14 | 7 | 4 | 8 | 11 | 18 | 30 | 12 | 10 | 9 | 11 | 17 | 72 |
| 3 | 7 | 27 | 84 | 9 | 12 | 263 | 27 | 1 | 31 | 95 | 0 | 19 | 175 | 316 | 106 | 74 | 46 | 36 | 40 | 52 | 16 | 6 | 9 | 5 | 17 | 27 | 56 | 69 | 69 | 55 | 31 | 19 | 11 | 4 | 4 |
| 34 | 20 | 14 | 26 | 73 | 42 | 58 | | | 1 | 26 | 51 | 102 | 287 | 269 | 55 | 43 | 25 | 67 | 111 | 88 | 26 | 52 | 114 | 90 | 126 | 128 | 223 | 186 | 159 | 112 | 89 | 66 | 52 | 34 | 23 |
| 146 | 42 | 23 | 1 | 0 | 0 | | | | 0 | 279 | 479 | 556 | 491 | 333 | 39 | 17 | 24 | 79 | 94 | 96 | 65 | 65 | 99 | 53 | 72 | 78 | 167 | 138 | 135 | 88 | 76 | 65 | 59 | 50 | 43 |
| 309 | 363 | 209 | 123 | 117 | 11 | 7 | 4 | 1 | 17 | 228 | 382 | 420 | 358 | 214 | 73 | 7 | 13 | 49 | 120 | 112 | 76 | 84 | 74 | 54 | 57 | 50 | 86 | 89 | 94 | 60 | 55 | 50 | 52 | 64 | 84 |
| 47 | 129 | 382 | 229 | 144 | 196 | 170 | 48 | 40 | 9 | 4 | 45 | 116 | 257 | 148 | 104 | 23 | 5 | 3 | 18 | 55 | 62 | 45 | 42 | 25 | 21 | 12 | 14 | 15 | 23 | 40 | 30 | 33 | 44 | 47 | 83 |
| 22 | 16 | 130 | 292 | 95 | 22 | 212 | 82 | 59 | 19 | 1 | 12 | 16 | 125 | 163 | 169 | 47 | 37 | 33 | 21 | 33 | 61 | 56 | 35 | 30 | 27 | 20 | 17 | 24 | 15 | 16 | 26 | 26 | 27 | 23 | 47 |
| 14 | 2 | 2 | 70 | 15 | 1 | 79 | 64 | 26 | 31 | 5 | 5 | 3 | 28 | 41 | 40 | 30 | 28 | 31 | 35 | 51 | 55 | 50 | 35 | 32 | 32 | 33 | 21 | 16 | 20 | 21 | 24 | 32 | 37 | 32 | 20 |
| | | | | | | | | | | | | | | 5 | 6 | 9 | 11 | 7 | 6 | 5 | 9 | 9 | 14 | 14 | 13 | 7 | 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA

FIGURE 21

FEBRUARY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

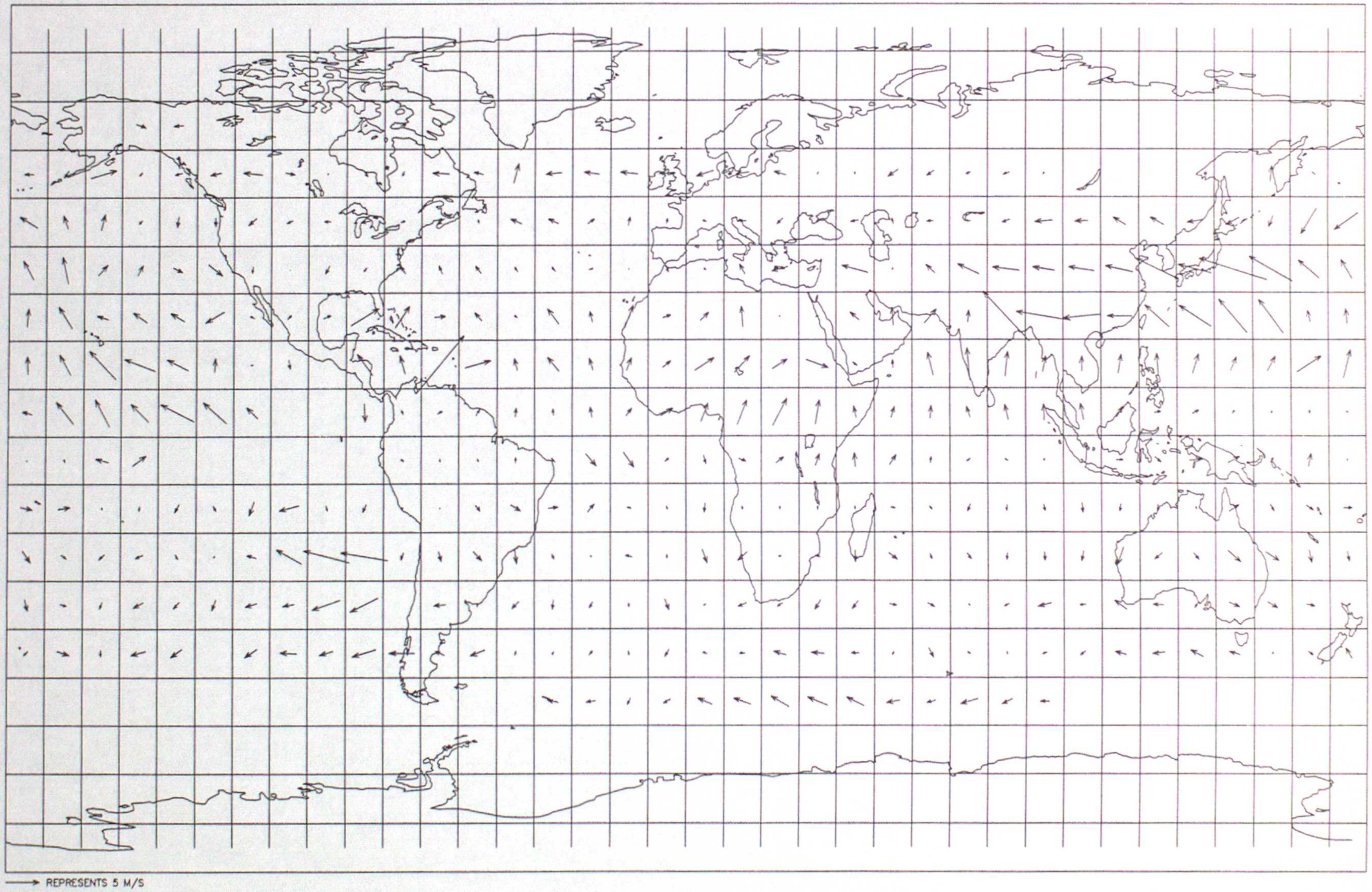
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

FEBRUARY 2000

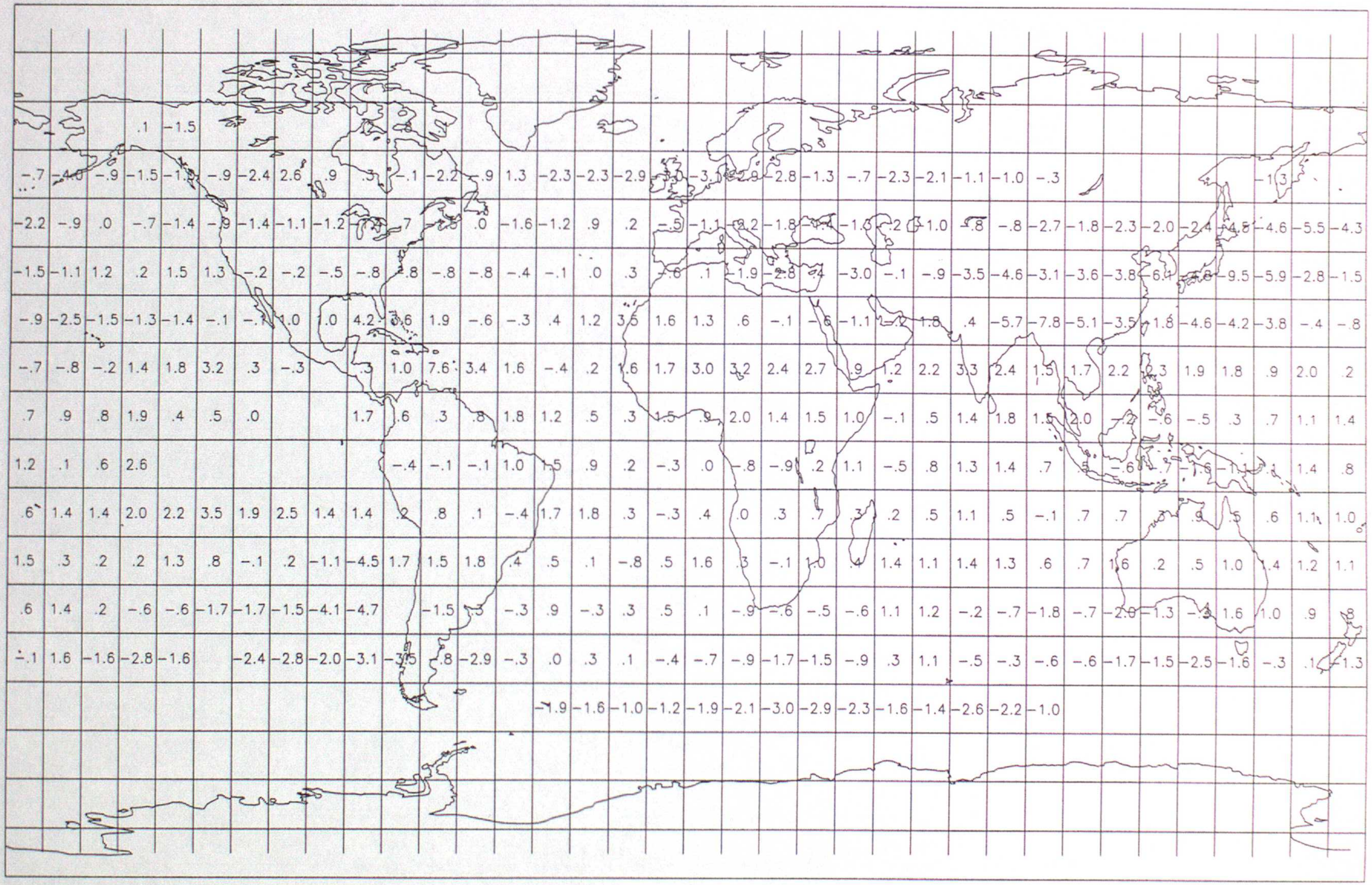
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

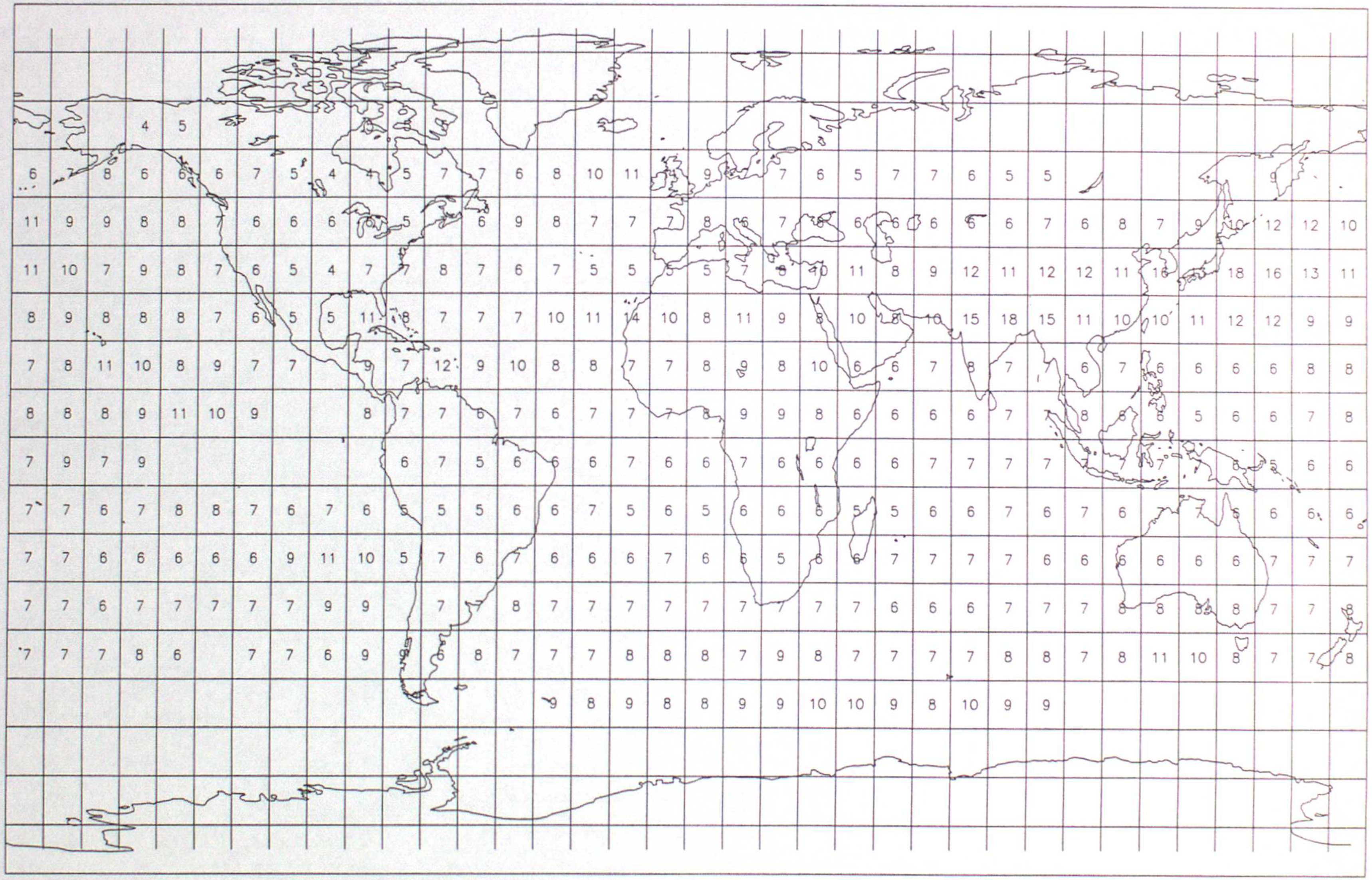
FIGURE 22



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
FEBRUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.1 -1.5
-.7 -4.0 -.9 -1.5 -1.5 -.9 -2.4 2.6 .9 .3 -.1 -2.2 -.9 1.3 -2.3 -2.3 -2.9 -3.0 -3.1 -2.9 -2.8 -1.3 -.7 -2.3 -2.1 -1.1 -1.0 -.3 -1.3
-2.2 -.9 .0 -.7 -1.4 -.9 -1.4 -1.1 -1.2 -.7 .7 -.5 .0 -1.6 -1.2 .9 .2 -.5 -1.1 -2.2 -1.8 -1.4 -1.6 -.2 -1.0 -.8 -.8 -2.7 -1.8 -2.3 -2.0 -2.4 -4.8 -4.6 -5.5 -4.3
-1.5 -1.1 1.2 .2 1.5 1.3 -.2 -.2 -.5 -.8 -.8 -.8 -.8 -.4 -.1 .0 .3 -.6 .1 -1.9 -2.8 -.4 -3.0 -.1 -.9 -3.5 -4.6 -3.1 -3.6 -3.8 -6.1 -4.8 -9.5 -5.9 -2.8 -1.5
-.9 -2.5 -1.5 -1.3 -1.4 -.1 -.1 1.0 1.0 4.2 3.6 1.9 -.6 -.3 .4 1.2 3.5 1.6 1.3 .6 -.1 -.6 -1.1 -.2 1.8 .4 -5.7 -7.8 -5.1 -3.5 -1.8 -4.6 -4.2 -3.8 -.4 -.8
-.7 -.8 -.2 1.4 1.8 3.2 .3 -.3 .3 1.0 7.6 3.4 1.6 -.4 .2 1.6 1.7 3.0 3.2 2.4 2.7 .9 1.2 2.2 3.3 2.4 1.5 1.7 2.2 2.3 1.9 1.8 .9 2.0 .2
.7 .9 .8 1.9 .4 .5 .0 1.7 .6 .3 .8 1.8 1.2 .5 .3 1.5 .9 2.0 1.4 1.5 1.0 -.1 .5 1.4 1.8 1.5 2.0 -.2 -.6 -.5 .3 .7 1.1 1.4
1.2 .1 .6 2.6 -.4 -.1 -.1 1.0 1.5 .9 .2 -.3 .0 -.8 -.9 .2 1.1 -.5 .8 1.3 1.4 .7 .5 -.6 -.7 -1.6 -1.1 .1 1.4 .8
.6 1.4 1.4 2.0 2.2 3.5 1.9 2.5 1.4 1.4 .2 .8 .1 -.4 1.7 1.8 .3 -.3 .4 .0 .3 .7 .3 .2 .5 1.1 .5 -.1 .7 .7 .3 .9 .5 .6 1.1 1.0
1.5 .3 .2 .2 1.3 .8 -.1 .2 -1.1 -4.5 1.7 1.5 1.8 .4 .5 .1 -.8 .5 1.6 .3 -.1 1.0 .4 1.4 1.1 1.4 1.3 .6 .7 1.6 .2 .5 1.0 1.4 1.2 1.1
.6 1.4 .2 -.6 -.6 -1.7 -1.7 -1.5 -4.1 -4.7 -1.5 .3 -.3 .9 -.3 .3 .5 .1 -.9 -.6 -.5 -.6 1.1 1.2 -.2 -.7 -1.8 -.7 -2.0 -1.3 -.3 1.6 1.0 .9 .8
-.1 1.6 -1.6 -2.8 -1.6 -2.4 -2.8 -2.0 -3.1 -3.5 -.8 -2.9 -.3 .0 .3 .1 -.4 -.7 -.9 -1.7 -1.5 -.9 .3 1.1 -.5 -.3 -.6 -.6 -1.7 -1.5 -2.5 -1.6 -.3 .1 -1.3
-1.9 -1.6 -1.0 -1.2 -1.9 -2.1 -3.0 -2.9 -2.3 -1.6 -1.4 -2.6 -2.2 -1.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
FEBRUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 5
6 7 8 6 6 6 7 5 4 4 5 7 7 6 8 10 11 9 7 6 5 7 7 6 5 5 9
11 9 9 8 8 7 6 6 6 5 6 9 8 7 7 7 8 6 7 6 6 6 6 6 7 6 8 7 9 10 12 12 10
11 10 7 9 8 7 6 5 4 7 7 8 7 6 7 5 5 5 5 7 8 10 11 8 9 12 11 12 12 11 16 18 16 13 11
8 9 8 8 8 7 6 5 5 11 8 7 7 7 10 11 14 10 8 11 9 8 10 8 10 15 18 15 11 10 10 11 12 12 9 9
7 8 11 10 8 9 7 7 9 7 12 9 10 8 8 7 7 8 9 8 10 6 6 7 8 7 7 6 7 6 6 6 6 8 8
8 8 8 9 11 10 9 8 7 7 6 7 6 7 7 7 8 9 9 8 6 6 6 6 7 7 8 6 6 5 6 6 7 8
7 9 7 9 6 7 5 6 6 6 7 6 6 7 6 6 6 6 7 7 7 7 7 7 7 5 6 6
7 7 6 7 8 8 7 6 7 6 5 5 5 6 6 7 5 6 5 6 6 6 5 5 6 6 7 6 7 6 7 7 5 6 6 6
7 7 6 6 6 6 6 9 11 10 5 7 6 7 6 6 6 7 6 6 5 6 6 7 7 7 7 6 6 6 6 6 6 7 7 7
7 7 6 7 7 7 7 7 9 9 7 7 8 7 7 7 7 7 7 7 7 7 6 6 6 7 7 7 8 8 8 8 7 7 8
7 7 7 8 6 7 7 6 9 9 6 8 7 7 7 8 8 8 7 9 8 7 7 7 7 8 8 7 8 11 10 8 7 7 8
9 8 9 8 8 9 9 10 10 9 8 10 9 9

## MONITORING OF SATELLITE TEMPERATURES

## MONITORING CENTRE: BRACKNELL

## MONTH: FEBRUARY 2000

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from NOAA-15.

**Standard of comparison** :Background field from UKMO global model.

**Selection Criteria** :All soundings.

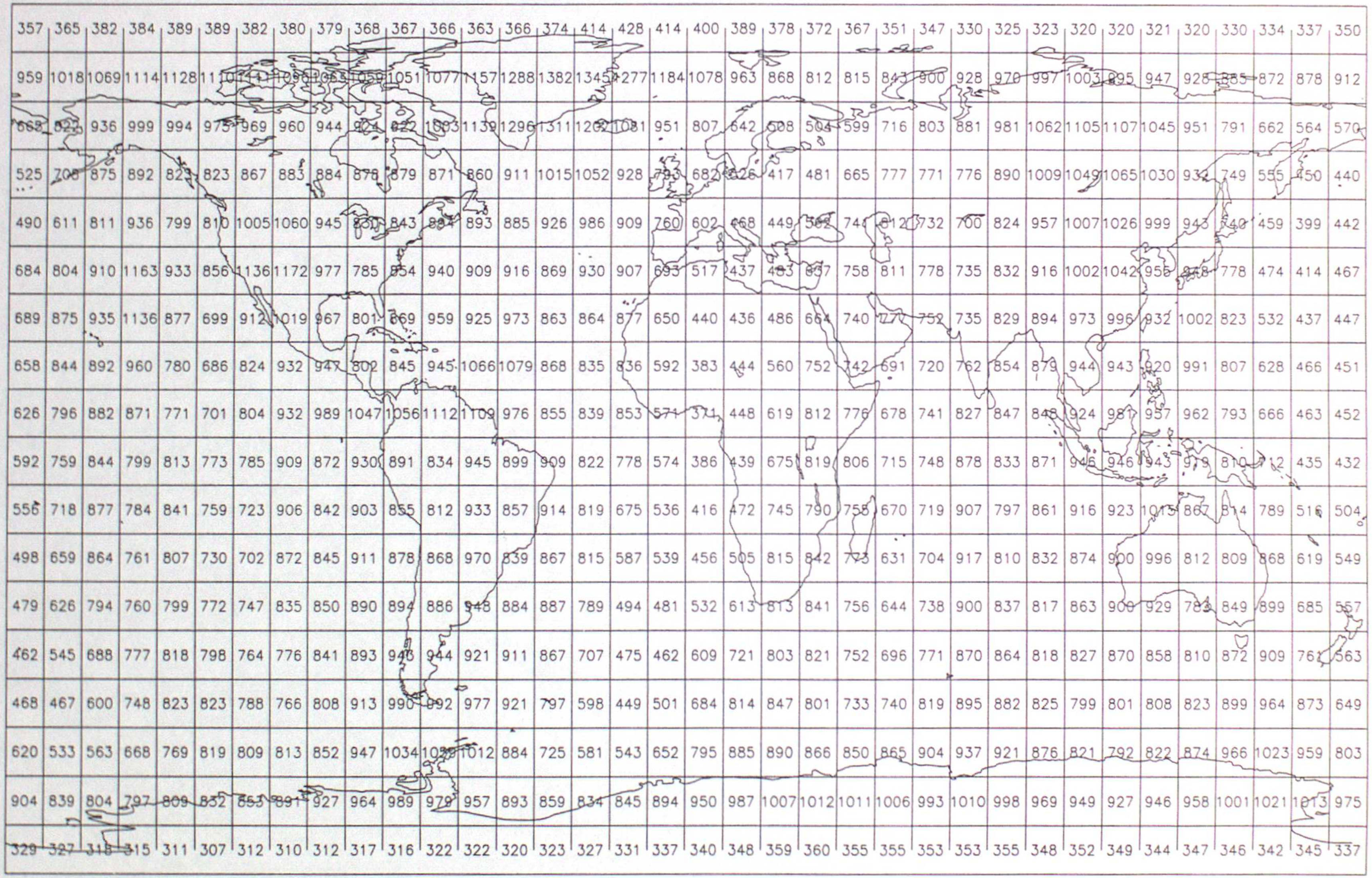
**Data Extracted** :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS
FEBRUARY 2000
NOAA-15, USING ALL OBSERVATIONS

FIGURE 25



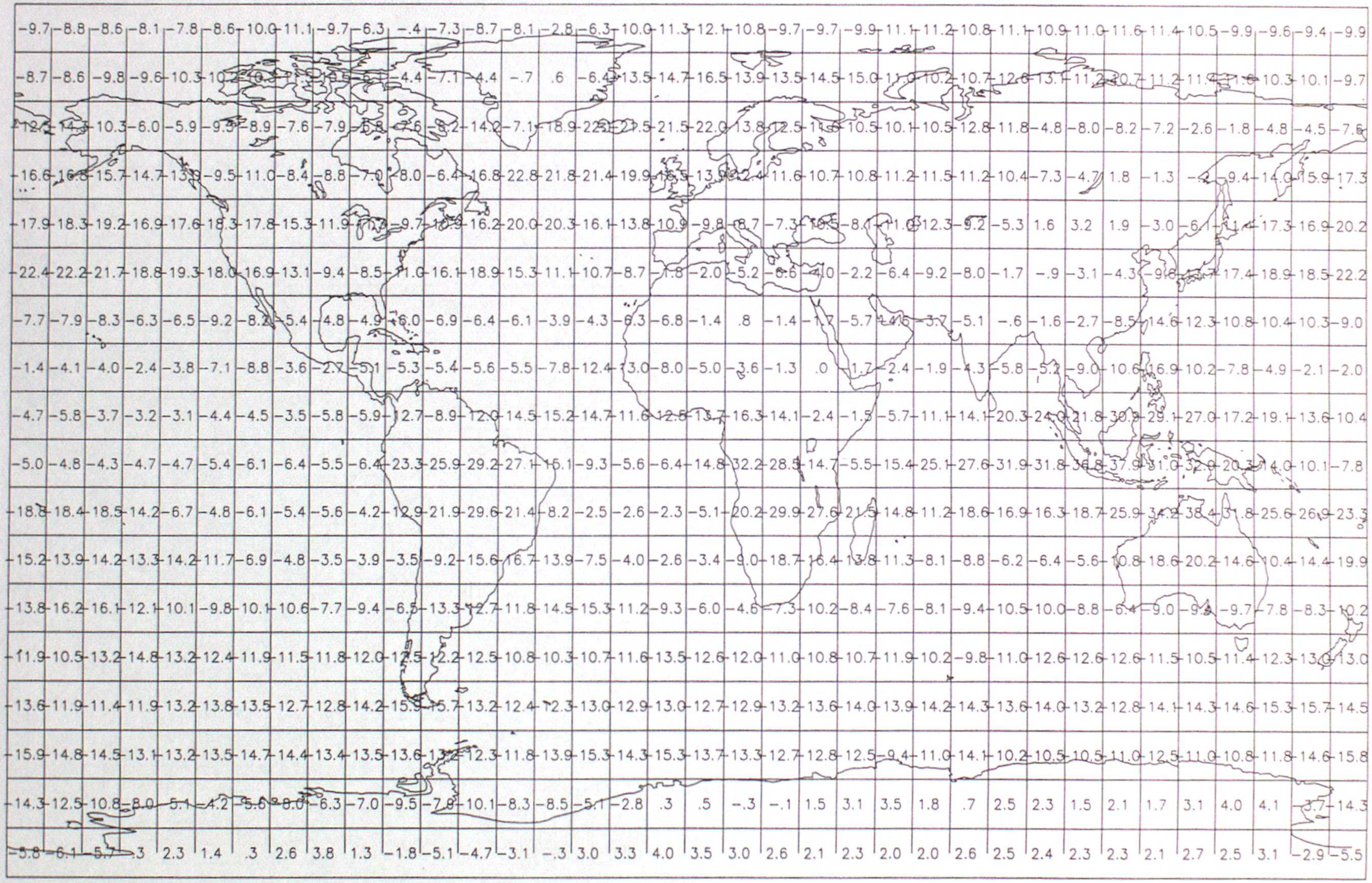
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 357 | 365 | 382 | 384 | 389 | 389 | 382 | 380 | 379 | 368 | 367 | 366 | 363 | 366 | 374 | 414 | 428 | 414 | 400 | 389 | 378 | 372 | 367 | 351 | 347 | 330 | 325 | 323 | 320 | 320 | 321 | 320 | 330 | 334 | 337 | 350 |
| 959 | 1018 | 1069 | 1114 | 1128 | 1110 | 1111 | 1096 | 1065 | 1059 | 1051 | 1077 | 1157 | 1288 | 1382 | 1345 | 1277 | 1184 | 1078 | 963 | 868 | 812 | 815 | 843 | 900 | 928 | 970 | 997 | 1003 | 895 | 947 | 928 | 885 | 872 | 878 | 912 |
| 668 | 822 | 936 | 999 | 994 | 975 | 969 | 960 | 944 | 924 | 822 | 1003 | 1139 | 1296 | 1311 | 1202 | 1081 | 951 | 807 | 642 | 608 | 504 | 599 | 716 | 803 | 881 | 981 | 1062 | 1105 | 1107 | 1045 | 951 | 791 | 662 | 564 | 570 |
| 525 | 708 | 875 | 892 | 823 | 823 | 867 | 883 | 884 | 878 | 879 | 871 | 860 | 911 | 1015 | 1052 | 928 | 793 | 682 | 626 | 417 | 481 | 665 | 777 | 771 | 776 | 890 | 1009 | 1049 | 1065 | 1030 | 932 | 749 | 555 | 450 | 440 |
| 490 | 611 | 811 | 936 | 799 | 810 | 1005 | 1060 | 945 | 830 | 843 | 884 | 893 | 885 | 926 | 986 | 909 | 760 | 602 | 468 | 449 | 562 | 744 | 812 | 732 | 700 | 824 | 957 | 1007 | 1026 | 999 | 943 | 740 | 459 | 399 | 442 |
| 684 | 804 | 910 | 1163 | 933 | 856 | 1136 | 1172 | 977 | 785 | 854 | 940 | 909 | 916 | 869 | 930 | 907 | 693 | 517 | 437 | 483 | 837 | 758 | 811 | 778 | 735 | 832 | 916 | 1002 | 1042 | 956 | 848 | 778 | 474 | 414 | 467 |
| 689 | 875 | 935 | 1136 | 877 | 699 | 912 | 1019 | 967 | 801 | 869 | 959 | 925 | 973 | 863 | 864 | 877 | 650 | 440 | 436 | 486 | 664 | 740 | 770 | 752 | 735 | 829 | 894 | 973 | 996 | 932 | 1002 | 823 | 532 | 437 | 447 |
| 658 | 844 | 892 | 960 | 780 | 686 | 824 | 932 | 947 | 802 | 845 | 945 | 1066 | 1079 | 868 | 835 | 836 | 592 | 383 | 444 | 560 | 752 | 742 | 691 | 720 | 762 | 854 | 879 | 944 | 943 | 920 | 991 | 807 | 628 | 466 | 451 |
| 626 | 796 | 882 | 871 | 771 | 701 | 804 | 932 | 989 | 1047 | 1056 | 1112 | 1109 | 976 | 855 | 839 | 853 | 571 | 371 | 448 | 619 | 812 | 776 | 678 | 741 | 827 | 847 | 848 | 924 | 981 | 957 | 962 | 793 | 666 | 463 | 452 |
| 592 | 759 | 844 | 799 | 813 | 773 | 785 | 909 | 872 | 930 | 891 | 834 | 945 | 899 | 909 | 822 | 778 | 574 | 386 | 439 | 675 | 819 | 806 | 715 | 748 | 878 | 833 | 871 | 946 | 946 | 943 | 979 | 810 | 712 | 435 | 432 |
| 556 | 718 | 877 | 784 | 841 | 759 | 723 | 906 | 842 | 903 | 855 | 812 | 933 | 857 | 914 | 819 | 675 | 536 | 416 | 472 | 745 | 790 | 755 | 670 | 719 | 907 | 797 | 861 | 916 | 923 | 1015 | 867 | 814 | 789 | 516 | 504 |
| 498 | 659 | 864 | 761 | 807 | 730 | 702 | 872 | 845 | 911 | 878 | 868 | 970 | 839 | 867 | 815 | 587 | 539 | 456 | 505 | 815 | 842 | 773 | 631 | 704 | 917 | 810 | 832 | 874 | 900 | 996 | 812 | 809 | 868 | 619 | 549 |
| 479 | 626 | 794 | 760 | 799 | 772 | 747 | 835 | 850 | 890 | 894 | 886 | 948 | 884 | 887 | 789 | 494 | 481 | 532 | 613 | 813 | 841 | 756 | 644 | 738 | 900 | 837 | 817 | 863 | 900 | 929 | 783 | 849 | 899 | 685 | 557 |
| 462 | 545 | 688 | 777 | 818 | 798 | 764 | 776 | 841 | 893 | 940 | 944 | 921 | 911 | 867 | 707 | 475 | 462 | 609 | 721 | 803 | 821 | 752 | 696 | 771 | 870 | 864 | 818 | 827 | 870 | 858 | 810 | 872 | 909 | 761 | 563 |
| 468 | 467 | 600 | 748 | 823 | 823 | 788 | 766 | 808 | 913 | 990 | 992 | 977 | 921 | 797 | 598 | 449 | 501 | 684 | 814 | 847 | 801 | 733 | 740 | 819 | 895 | 882 | 825 | 799 | 801 | 808 | 823 | 899 | 964 | 873 | 649 |
| 620 | 533 | 563 | 668 | 769 | 819 | 809 | 813 | 852 | 947 | 1034 | 1039 | 1012 | 884 | 725 | 581 | 543 | 652 | 795 | 885 | 890 | 866 | 850 | 865 | 904 | 937 | 921 | 876 | 821 | 792 | 822 | 874 | 966 | 1023 | 959 | 803 |
| 904 | 839 | 804 | 797 | 809 | 832 | 853 | 891 | 927 | 964 | 989 | 979 | 957 | 893 | 859 | 834 | 845 | 894 | 950 | 987 | 1007 | 1012 | 1011 | 1006 | 993 | 1010 | 998 | 969 | 949 | 927 | 946 | 958 | 1001 | 1021 | 1013 | 975 |
| 329 | 327 | 318 | 315 | 311 | 307 | 312 | 310 | 312 | 317 | 316 | 322 | 322 | 320 | 323 | 327 | 331 | 337 | 340 | 348 | 359 | 360 | 355 | 355 | 353 | 353 | 355 | 348 | 352 | 349 | 344 | 347 | 346 | 342 | 345 | 337 |

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

FIGURE 26

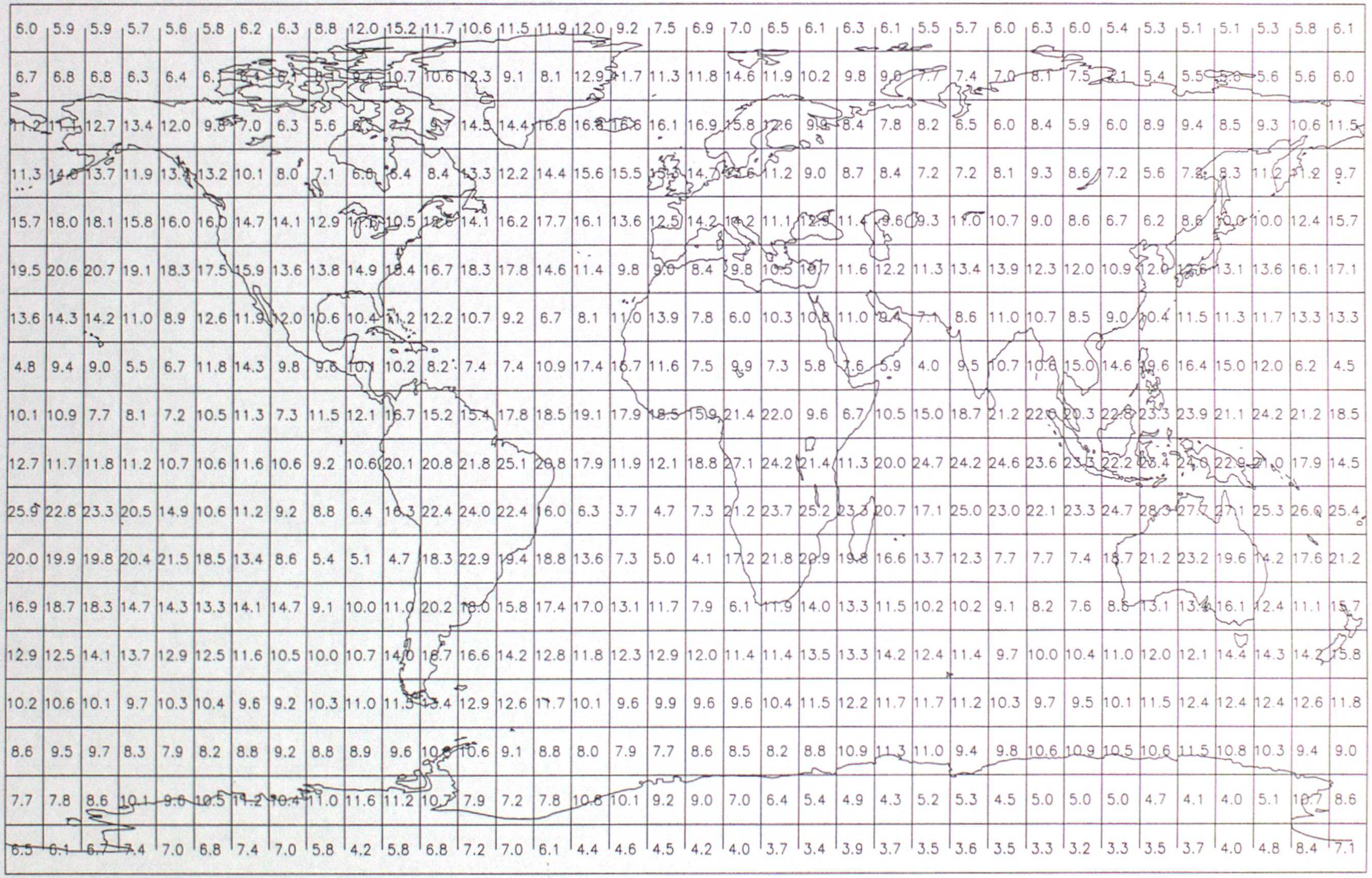
FEBRUARY 2000 : HIRS8 channel (Surface)

NOAA–15, USING ALL OBSERVATIONS


-9.7 -8.8 -8.6 -8.1 -7.8 -8.6 -10.0 -11.1 -9.7 -6.3 -.4 -7.3 -8.7 -8.1 -2.8 -6.3 -10.0 -11.3 -12.1 -10.8 -9.7 -9.7 -9.9 -11.1 -11.2 -10.8 -11.1 -10.9 -11.0 -11.6 -11.4 -10.5 -9.9 -9.6 -9.4 -9.9
-8.7 -8.6 -9.8 -9.6 -10.3 -10.2 -10.3 -11.3 -13.6 -6.1 -4.4 -7.1 -4.4 -.7 .6 -6.4 -13.5 -14.7 -16.5 -13.9 -13.5 -14.5 -15.0 -11.0 -10.2 -10.7 -12.6 -13.1 -11.2 -20.7 -11.2 -11.7 -11.6 -10.3 -10.1 -9.7
-12.5 -14.3 -10.3 -6.0 -5.9 -9.3 -8.9 -7.6 -7.9 -5.8 -7.6 -8.2 -14.2 -7.1 -18.9 -22.5 -21.5 -21.5 -22.0 -13.8 -12.5 -11.6 -10.5 -10.1 -10.5 -12.8 -11.8 -4.8 -8.0 -8.2 -7.2 -2.6 -1.8 -4.8 -4.5 -7.6
-16.6 -16.8 -15.7 -14.7 -13.9 -9.5 -11.0 -8.4 -8.8 -7.0 -8.0 -6.4 -16.8 -22.8 -21.8 -21.4 -19.9 -16.5 -13.9 -12.4 -11.6 -10.7 -10.8 -11.2 -11.5 -11.2 -10.4 -7.3 -4.7 1.8 -1.3 -.2 -9.4 -14.0 -15.9 -17.3
-17.9 -18.3 -19.2 -16.9 -17.6 -18.3 -17.8 -15.3 -11.9 -11.7 -9.7 -10.9 -16.2 -20.0 -20.3 -16.1 -13.8 -10.9 -9.8 -8.7 -7.3 -10.5 -8.1 -11.0 -12.3 -9.2 -5.3 1.6 3.2 1.9 -3.0 -6.1 -11.4 -17.3 -16.9 -20.2
-22.4 -22.2 -21.7 -18.8 -19.3 -18.0 -16.9 -13.1 -9.4 -8.5 -11.0 -16.1 -18.9 -15.3 -11.1 -10.7 -8.7 -1.8 -2.0 -5.2 -6.6 -4.0 -2.2 -6.4 -9.2 -8.0 -1.7 -.9 -3.1 -4.3 -9.6 -13.7 -17.4 -18.9 -18.5 -22.2
-7.7 -7.9 -8.3 -6.3 -6.5 -9.2 -8.2 -5.4 -4.8 -4.9 -6.0 -6.9 -6.4 -6.1 -3.9 -4.3 -6.3 -6.8 -1.4 .8 -1.4 -1.7 -5.7 -4.6 -3.7 -5.1 -.6 -1.6 -2.7 -8.5 -14.6 -12.3 -10.8 -10.4 -10.3 -9.0
-1.4 -4.1 -4.0 -2.4 -3.8 -7.1 -8.8 -3.6 -2.7 -5.1 -5.3 -5.4 -5.6 -5.5 -7.8 -12.4 -13.0 -8.0 -5.0 -3.6 -1.3 .0 -1.7 -2.4 -1.9 -4.3 -5.8 -5.2 -9.0 -10.6 -16.9 -10.2 -7.8 -4.9 -2.1 -2.0
-4.7 -5.8 -3.7 -3.2 -3.1 -4.4 -4.5 -3.5 -5.8 -5.9 -12.7 -8.9 -12.0 -14.5 -15.2 -14.7 -11.6 -12.5 -13.7 -16.3 -14.1 -2.4 -1.5 -5.7 -11.1 -14.1 -20.3 -24.0 -21.8 -30.9 -29.1 -27.0 -17.2 -19.1 -13.6 -10.4
-5.0 -4.8 -4.3 -4.7 -4.7 -5.4 -6.1 -6.4 -5.5 -6.4 -23.3 -25.9 -29.2 -27.1 -15.1 -9.3 -5.6 -6.4 -14.8 -32.2 -28.5 -14.7 -5.5 -15.4 -25.1 -27.6 -31.9 -31.8 -36.8 -37.9 -31.0 -32.0 -20.3 -14.0 -10.1 -7.8
-18.8 -18.4 -18.5 -14.2 -6.7 -4.8 -6.1 -5.4 -5.6 -4.2 -12.9 -21.9 -29.6 -21.4 -8.2 -2.5 -2.6 -2.3 -5.1 -20.2 -29.9 -27.6 -21.5 -14.8 -11.2 -18.6 -16.9 -16.3 -18.7 -25.9 -34.2 -38.4 -31.8 -25.6 -26.9 -23.3
-15.2 -13.9 -14.2 -13.3 -14.2 -11.7 -6.9 -4.8 -3.5 -3.9 -3.5 -9.2 -15.6 -16.7 -13.9 -7.5 -4.0 -2.6 -3.4 -9.0 -18.7 -16.4 -13.8 -11.3 -8.1 -8.8 -6.2 -6.4 -5.6 -10.8 -18.6 -20.2 -14.6 -10.4 -14.4 -19.9
-13.8 -16.2 -16.1 -12.1 -10.1 -9.8 -10.1 -10.6 -7.7 -9.4 -6.5 -13.3 -12.7 -11.8 -14.5 -15.3 -11.2 -9.3 -6.0 -4.6 -7.3 -10.2 -8.4 -7.6 -8.1 -9.4 -10.5 -10.0 -8.8 -6.4 -9.0 -9.3 -9.7 -7.8 -8.3 -10.2
-11.9 -10.5 -13.2 -14.8 -13.2 -12.4 -11.9 -11.5 -11.8 -12.0 -12.5 -12.2 -12.5 -10.8 -10.3 -10.7 -11.6 -13.5 -12.6 -12.0 -11.0 -10.8 -10.7 -11.9 -10.2 -9.8 -11.0 -12.6 -12.6 -12.6 -11.5 -10.5 -11.4 -12.3 -13.0 -13.0
-13.6 -11.9 -11.4 -11.9 -13.2 -13.8 -13.5 -12.7 -12.8 -14.2 -15.9 -15.7 -13.2 -12.4 -12.3 -13.0 -12.9 -13.0 -12.7 -12.9 -13.2 -13.6 -14.0 -13.9 -14.2 -14.3 -13.6 -14.0 -13.2 -12.8 -14.1 -14.3 -14.6 -15.3 -15.7 -14.5
-15.9 -14.8 -14.5 -13.1 -13.2 -13.5 -14.7 -14.4 -13.4 -13.5 -13.6 -13.2 -12.3 -11.8 -13.9 -15.3 -14.3 -15.3 -13.7 -13.3 -12.7 -12.8 -12.5 -9.4 -11.0 -14.1 -10.2 -10.5 -10.5 -11.0 -12.5 -11.0 -10.8 -11.8 -14.6 -15.8
-14.3 -12.5 -10.8 -8.0 -5.1 -4.2 -5.6 -8.0 -6.3 -7.0 -9.5 -7.8 -10.1 -8.3 -8.5 -5.1 -2.8 .3 .5 -.3 -.1 1.5 3.1 3.5 1.8 .7 2.5 2.3 1.5 2.1 1.7 3.1 4.0 4.1 -3.7 -14.3
-5.8 -6.1 -5.7 .3 2.3 1.4 .3 2.6 3.8 1.3 -1.8 -5.1 -4.7 -3.1 -.3 3.0 3.3 4.0 3.5 3.0 2.6 2.1 2.3 2.0 2.0 2.6 2.5 2.4 2.3 2.3 2.1 2.7 2.5 3.1 -2.9 -5.5

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : HIRS8 channel (Surface)
NOAA-15, USING ALL OBSERVATIONS

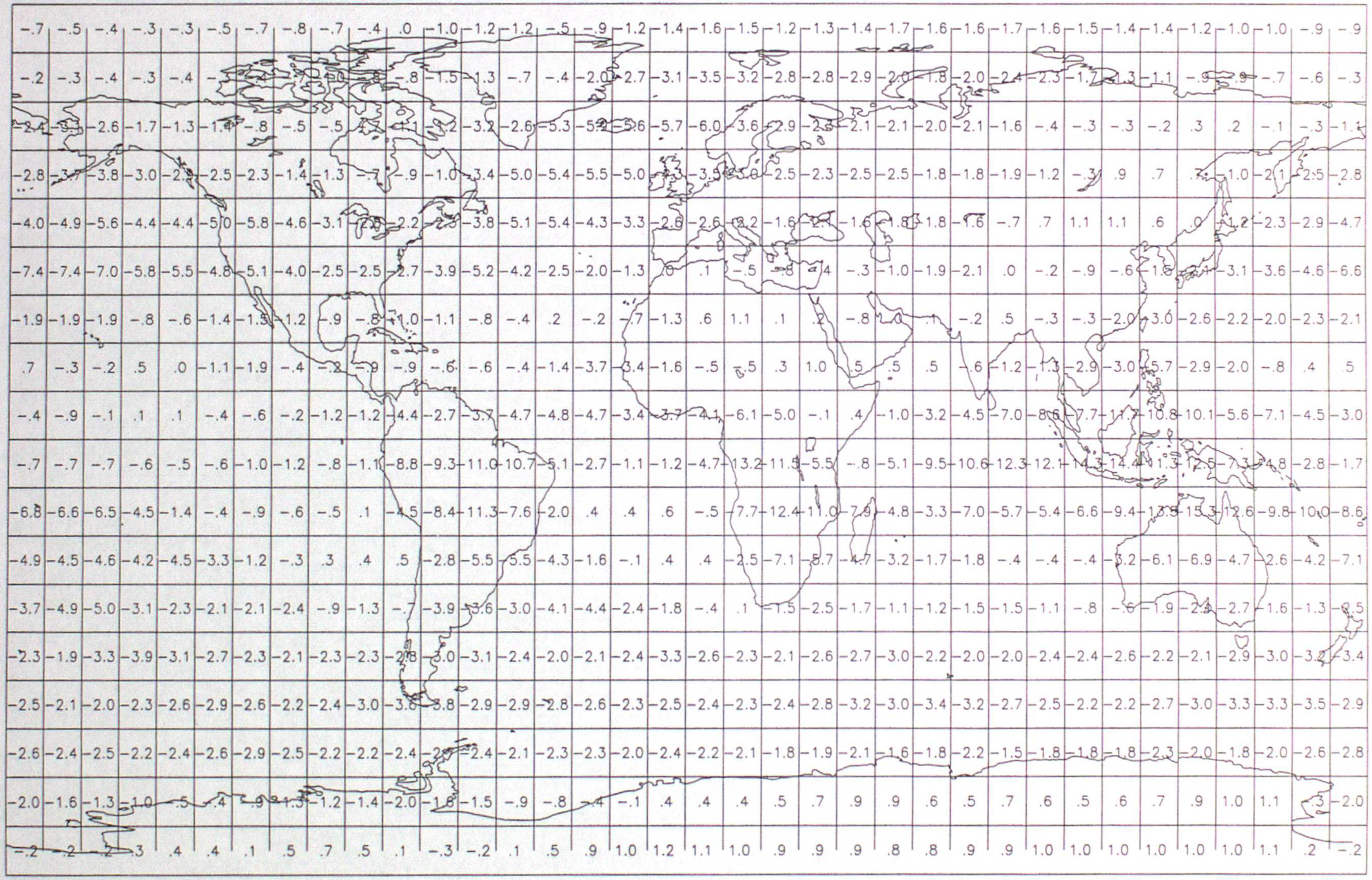
FIGURE 27



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.0 | 5.9 | 5.9 | 5.7 | 5.6 | 5.8 | 6.2 | 6.3 | 8.8 | 12.0 | 15.2 | 11.7 | 10.6 | 11.5 | 11.9 | 12.0 | 9.2 | 7.5 | 6.9 | 7.0 | 6.5 | 6.1 | 6.3 | 6.1 | 5.5 | 5.7 | 6.0 | 6.3 | 6.0 | 5.4 | 5.3 | 5.1 | 5.1 | 5.3 | 5.8 | 6.1 |
| 6.7 | 6.8 | 6.8 | 6.3 | 6.4 | [illegible] | 6.4 | 6.1 | [illegible] | 9.4 | 10.7 | 10.6 | 12.3 | 9.1 | 8.1 | 12.9 | 11.7 | 11.3 | 11.8 | 14.6 | 11.9 | 10.2 | 9.8 | 9.0 | 7.7 | 7.4 | 7.0 | 8.1 | 7.5 | 7.1 | 5.4 | 5.5 | 5.6 | 5.6 | 5.6 | 6.0 |
| 11.2 | 11.1 | 12.7 | 13.4 | 12.0 | 9.8 | 7.0 | 6.3 | 5.6 | [illegible] | 7.7 | 9.7 | 14.5 | 14.4 | 16.8 | 16.8 | 16.6 | 16.1 | 16.9 | 15.8 | 12.6 | 9.9 | 8.4 | 7.8 | 8.2 | 6.5 | 6.0 | 8.4 | 5.9 | 6.0 | 8.9 | 9.4 | 8.5 | 9.3 | 10.6 | 11.5 |
| 11.3 | 14.0 | 13.7 | 11.9 | 13.4 | 13.2 | 10.1 | 8.0 | 7.1 | 6.8 | 6.4 | 8.4 | 13.3 | 12.2 | 14.4 | 15.6 | 15.5 | 15.3 | 14.7 | 15.6 | 11.2 | 9.0 | 8.7 | 8.4 | 7.2 | 7.2 | 8.1 | 9.3 | 8.6 | 7.2 | 5.6 | 7.8 | 8.3 | 11.2 | 11.2 | 9.7 |
| 15.7 | 18.0 | 18.1 | 15.8 | 16.0 | 16.0 | 14.7 | 14.1 | 12.9 | 11.0 | 10.5 | 12.6 | 14.1 | 16.2 | 17.7 | 16.1 | 13.6 | 12.5 | 14.2 | 14.2 | 11.1 | 12.9 | 11.4 | 9.6 | 9.3 | 11.0 | 10.7 | 9.0 | 8.6 | 6.7 | 6.2 | 8.6 | 10.0 | 10.0 | 12.4 | 15.7 |
| 19.5 | 20.6 | 20.7 | 19.1 | 18.3 | 17.5 | 15.9 | 13.6 | 13.8 | 14.9 | 18.4 | 16.7 | 18.3 | 17.8 | 14.6 | 11.4 | 9.8 | 9.0 | 8.4 | 9.8 | 10.5 | 10.7 | 11.6 | 12.2 | 11.3 | 13.4 | 13.9 | 12.3 | 12.0 | 10.9 | 12.0 | 12.6 | 13.1 | 13.6 | 16.1 | 17.1 |
| 13.6 | 14.3 | 14.2 | 11.0 | 8.9 | 12.6 | 11.9 | 12.0 | 10.6 | 10.4 | 11.2 | 12.2 | 10.7 | 9.2 | 6.7 | 8.1 | 11.0 | 13.9 | 7.8 | 6.0 | 10.3 | 10.8 | 11.0 | 9.4 | 7.1 | 8.6 | 11.0 | 10.7 | 8.5 | 9.0 | 10.4 | 11.5 | 11.3 | 11.7 | 13.3 | 13.3 |
| 4.8 | 9.4 | 9.0 | 5.5 | 6.7 | 11.8 | 14.3 | 9.8 | 9.6 | 10.1 | 10.2 | 8.2 | 7.4 | 7.4 | 10.9 | 17.4 | 16.7 | 11.6 | 7.5 | 9.9 | 7.3 | 5.8 | 7.6 | 5.9 | 4.0 | 9.5 | 10.7 | 10.6 | 15.0 | 14.6 | 19.6 | 16.4 | 15.0 | 12.0 | 6.2 | 4.5 |
| 10.1 | 10.9 | 7.7 | 8.1 | 7.2 | 10.5 | 11.3 | 7.3 | 11.5 | 12.1 | 16.7 | 15.2 | 15.4 | 17.8 | 18.5 | 19.1 | 17.9 | 18.5 | 15.9 | 21.4 | 22.0 | 9.6 | 6.7 | 10.5 | 15.0 | 18.7 | 21.2 | 22.0 | 20.3 | 22.8 | 23.3 | 23.9 | 21.1 | 24.2 | 21.2 | 18.5 |
| 12.7 | 11.7 | 11.8 | 11.2 | 10.7 | 10.6 | 11.6 | 10.6 | 9.2 | 10.6 | 20.1 | 20.8 | 21.8 | 25.1 | 20.8 | 17.9 | 11.9 | 12.1 | 18.8 | 27.1 | 24.2 | 21.4 | 11.3 | 20.0 | 24.7 | 24.2 | 24.6 | 23.6 | 23.3 | 22.2 | 23.4 | 24.0 | 22.9 | 21.0 | 17.9 | 14.5 |
| 25.9 | 22.8 | 23.3 | 20.5 | 14.9 | 10.6 | 11.2 | 9.2 | 8.8 | 6.4 | 16.3 | 22.4 | 24.0 | 22.4 | 16.0 | 6.3 | 3.7 | 4.7 | 7.3 | 21.2 | 23.7 | 25.2 | 23.3 | 20.7 | 17.1 | 25.0 | 23.0 | 22.1 | 23.3 | 24.7 | 28.3 | 27.7 | 27.1 | 25.3 | 26.0 | 25.4 |
| 20.0 | 19.9 | 19.8 | 20.4 | 21.5 | 18.5 | 13.4 | 8.6 | 5.4 | 5.1 | 4.7 | 18.3 | 22.9 | 19.4 | 18.8 | 13.6 | 7.3 | 5.0 | 4.1 | 17.2 | 21.8 | 20.9 | 19.8 | 16.6 | 13.7 | 12.3 | 7.7 | 7.7 | 7.4 | 18.7 | 21.2 | 23.2 | 19.6 | 14.2 | 17.6 | 21.2 |
| 16.9 | 18.7 | 18.3 | 14.7 | 14.3 | 13.3 | 14.1 | 14.7 | 9.1 | 10.0 | 11.0 | 20.2 | 18.0 | 15.8 | 17.4 | 17.0 | 13.1 | 11.7 | 7.9 | 6.1 | 11.9 | 14.0 | 13.3 | 11.5 | 10.2 | 10.2 | 9.1 | 8.2 | 7.6 | 8.5 | 13.1 | 13.4 | 16.1 | 12.4 | 11.1 | 15.7 |
| 12.9 | 12.5 | 14.1 | 13.7 | 12.9 | 12.5 | 11.6 | 10.5 | 10.0 | 10.7 | 14.0 | 16.7 | 16.6 | 14.2 | 12.8 | 11.8 | 12.3 | 12.9 | 12.0 | 11.4 | 11.4 | 13.5 | 13.3 | 14.2 | 12.4 | 11.4 | 9.7 | 10.0 | 10.4 | 11.0 | 12.0 | 12.1 | 14.4 | 14.3 | 14.2 | 15.8 |
| 10.2 | 10.6 | 10.1 | 9.7 | 10.3 | 10.4 | 9.6 | 9.2 | 10.3 | 11.0 | 11.5 | 13.4 | 12.9 | 12.6 | 11.7 | 10.1 | 9.6 | 9.9 | 9.6 | 9.6 | 10.4 | 11.5 | 12.2 | 11.7 | 11.7 | 11.2 | 10.3 | 9.7 | 9.5 | 10.1 | 11.5 | 12.4 | 12.4 | 12.4 | 12.6 | 11.8 |
| 8.6 | 9.5 | 9.7 | 8.3 | 7.9 | 8.2 | 8.8 | 9.2 | 8.8 | 8.9 | 9.6 | 10.6 | 10.6 | 9.1 | 8.8 | 8.0 | 7.9 | 7.7 | 8.6 | 8.5 | 8.2 | 8.8 | 10.9 | 11.3 | 11.0 | 9.4 | 9.8 | 10.6 | 10.9 | 10.5 | 10.6 | 11.5 | 10.8 | 10.3 | 9.4 | 9.0 |
| 7.7 | 7.8 | 8.6 | 10.1 | 9.6 | 10.5 | 11.2 | 10.4 | 11.0 | 11.6 | 11.2 | 10.7 | 7.9 | 7.2 | 7.8 | 10.8 | 10.1 | 9.2 | 9.0 | 7.0 | 6.4 | 5.4 | 4.9 | 4.3 | 5.2 | 5.3 | 4.5 | 5.0 | 5.0 | 5.0 | 4.7 | 4.1 | 4.0 | 5.1 | 10.7 | 8.6 |
| 6.5 | 6.1 | 6.7 | 7.4 | 7.0 | 6.8 | 7.4 | 7.0 | 5.8 | 4.2 | 5.8 | 6.8 | 7.2 | 7.0 | 6.1 | 4.4 | 4.6 | 4.5 | 4.2 | 4.0 | 3.7 | 3.4 | 3.9 | 3.7 | 3.5 | 3.6 | 3.5 | 3.3 | 3.2 | 3.3 | 3.5 | 3.7 | 4.0 | 4.8 | 8.4 | 7.1 |

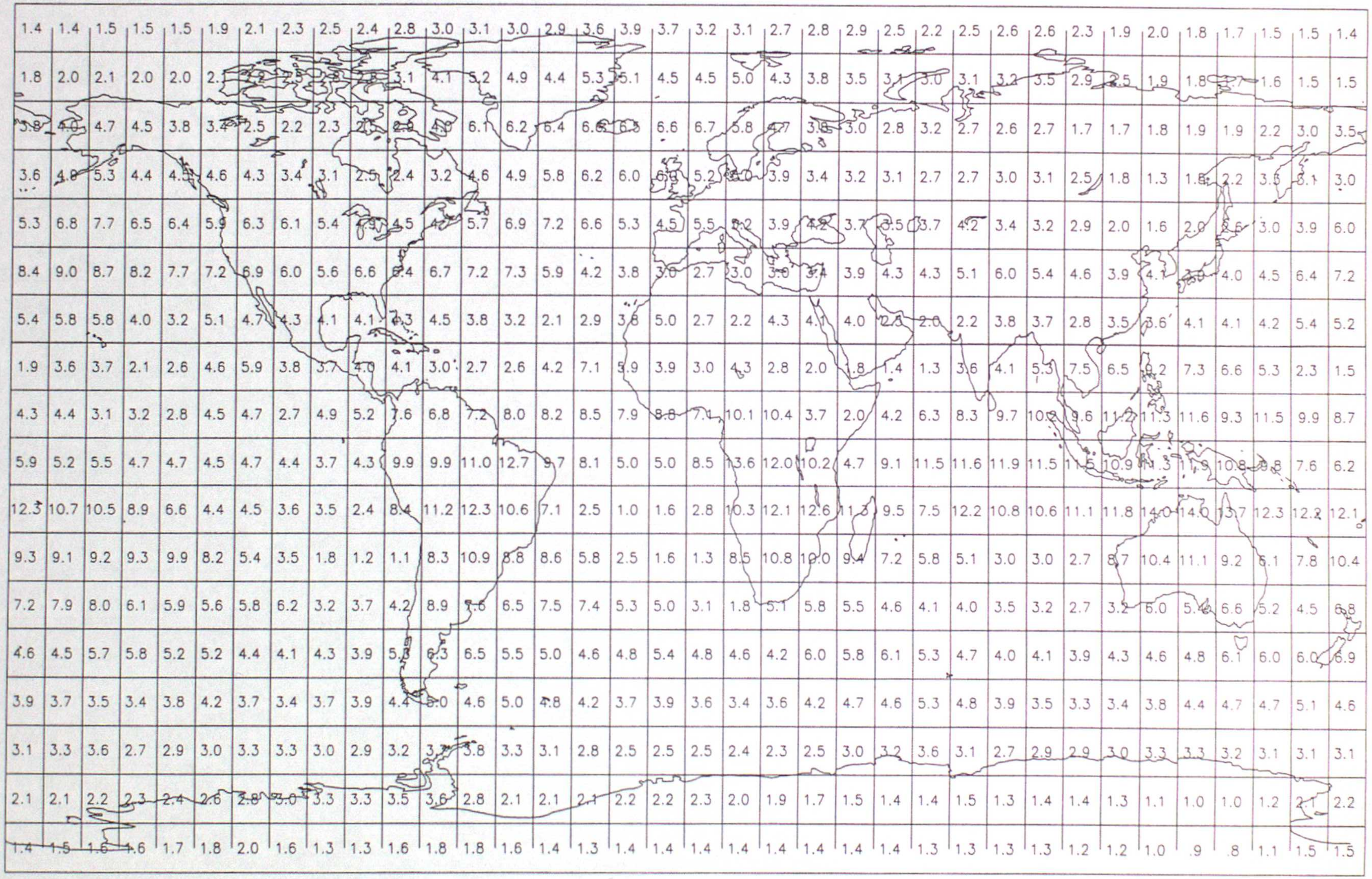
ATOVS : MEAN O−B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
FEBRUARY 2000 : HIRS15 Channel (700 hPa)
NOAA−15, USING ALL OBSERVATIONS

FIGURE 28


-.7 -.5 -.4 -.3 -.3 -.5 -.7 -.8 -.7 -.4 .0 -1.0 -1.2 -1.2 -.5 -.9 -1.2 -1.4 -1.6 -1.5 -1.2 -1.3 -1.4 -1.7 -1.6 -1.6 -1.7 -1.6 -1.5 -1.4 -1.4 -1.2 -1.0 -1.0 -.9 -.9
-.2 -.3 -.4 -.3 -.4 -.4 -.7 -.8 -1.5 -1.3 -.7 -.4 -2.0 -2.7 -3.1 -3.5 -3.2 -2.8 -2.8 -2.9 -2.0 -1.8 -2.0 -2.4 -2.3 -1.7 -1.3 -1.1 -.9 -.9 -.7 -.6 -.3
-2.4 -3.3 -2.6 -1.7 -1.3 -1.4 -.8 -.5 -.5 -.7 -1.1 -1.2 -3.2 -2.6 -5.3 -5.2 -5.6 -5.7 -6.0 -3.6 -2.9 -2.3 -2.1 -2.1 -2.0 -2.1 -1.6 -.4 -.3 -.3 -.2 .3 .2 -.1 -.3 -1.1
-2.8 -3.7 -3.8 -3.0 -2.9 -2.5 -2.3 -1.4 -1.3 -.7 -.9 -1.0 -3.4 -5.0 -5.4 -5.5 -5.0 -4.3 -3.5 -3.0 -2.5 -2.3 -2.5 -2.5 -1.8 -1.8 -1.9 -1.2 -.3 .9 .7 .7 -1.0 -2.1 -2.5 -2.8
-4.0 -4.9 -5.6 -4.4 -4.4 -5.0 -5.8 -4.6 -3.1 -2.0 -2.2 -2.3 -3.8 -5.1 -5.4 -4.3 -3.3 -2.6 -2.6 -2.2 -1.6 -2.1 -1.6 -1.8 -1.8 -1.6 -.7 .7 1.1 1.1 .6 .0 -1.2 -2.3 -2.9 -4.7
-7.4 -7.4 -7.0 -5.8 -5.5 -4.8 -5.1 -4.0 -2.5 -2.5 -2.7 -3.9 -5.2 -4.2 -2.5 -2.0 -1.3 .0 .1 -.5 -.8 -.4 -.3 -1.0 -1.9 -2.1 .0 -.2 -.9 -.6 -1.6 -2.1 -3.1 -3.6 -4.6 -6.6
-1.9 -1.9 -1.9 -.8 -.6 -1.4 -1.5 -1.2 -.9 -.8 -1.0 -1.1 -.8 -.4 .2 -.2 -.7 -1.3 .6 1.1 .1 .2 -.8 -1.0 .1 -.2 .5 -.3 -.3 -2.0 -3.0 -2.6 -2.2 -2.0 -2.3 -2.1
.7 -.3 -.2 .5 .0 -1.1 -1.9 -.4 -.2 -.9 -.9 -.6 -.6 -.4 -1.4 -3.7 -3.4 -1.6 -.5 .5 .3 1.0 .5 .5 .5 -.6 -1.2 -1.3 -2.9 -3.0 -5.7 -2.9 -2.0 -.8 .4 .5
-.4 -.9 -.1 .1 .1 -.4 -.6 -.2 -1.2 -1.2 -4.4 -2.7 -3.7 -4.7 -4.8 -4.7 -3.4 -3.7 -4.1 -6.1 -5.0 -.1 .4 -1.0 -3.2 -4.5 -7.0 -8.6 -7.7 -11.7 -10.8 -10.1 -5.6 -7.1 -4.5 -3.0
-.7 -.7 -.7 -.6 -.5 -.6 -1.0 -1.2 -.8 -1.1 -8.8 -9.3 -11.0 -10.7 -5.1 -2.7 -1.1 -1.2 -4.7 -13.2 -11.5 -5.5 -.8 -5.1 -9.5 -10.6 -12.3 -12.1 -14.3 -14.4 -11.3 -12.5 -7.3 -4.8 -2.8 -1.7
-6.8 -6.6 -6.5 -4.5 -1.4 -.4 -.9 -.6 -.5 .1 -4.5 -8.4 -11.3 -7.6 -2.0 .4 .4 .6 -.5 -7.7 -12.4 -11.0 -7.9 -4.8 -3.3 -7.0 -5.7 -5.4 -6.6 -9.4 -13.5 -15.3 -12.6 -9.8 -10.0 -8.6
-4.9 -4.5 -4.6 -4.2 -4.5 -3.3 -1.2 -.3 .3 .4 .5 -2.8 -5.5 -5.5 -4.3 -1.6 -.1 .4 .4 -2.5 -7.1 -5.7 -4.7 -3.2 -1.7 -1.8 -.4 -.4 -.4 -3.2 -6.1 -6.9 -4.7 -2.6 -4.2 -7.1
-3.7 -4.9 -5.0 -3.1 -2.3 -2.1 -2.1 -2.4 -.9 -1.3 -.7 -3.9 -3.6 -3.0 -4.1 -4.4 -2.4 -1.8 -.4 .1 -1.5 -2.5 -1.7 -1.1 -1.2 -1.5 -1.5 -1.1 -.8 -.6 -1.9 -2.3 -2.7 -1.6 -1.3 -2.5
-2.3 -1.9 -3.3 -3.9 -3.1 -2.7 -2.3 -2.1 -2.3 -2.3 -2.8 -3.0 -3.1 -2.4 -2.0 -2.1 -2.4 -3.3 -2.6 -2.3 -2.1 -2.6 -2.7 -3.0 -2.2 -2.0 -2.0 -2.4 -2.4 -2.6 -2.2 -2.1 -2.9 -3.0 -3.2 -3.4
-2.5 -2.1 -2.0 -2.3 -2.6 -2.9 -2.6 -2.2 -2.4 -3.0 -3.6 -3.8 -2.9 -2.9 -2.8 -2.6 -2.3 -2.5 -2.4 -2.3 -2.4 -2.8 -3.2 -3.0 -3.4 -3.2 -2.7 -2.5 -2.2 -2.2 -2.7 -3.0 -3.3 -3.3 -3.5 -2.9
-2.6 -2.4 -2.5 -2.2 -2.4 -2.6 -2.9 -2.5 -2.2 -2.2 -2.4 -2.4 -2.1 -2.3 -2.3 -2.0 -2.4 -2.2 -2.1 -1.8 -1.9 -2.1 -1.6 -1.8 -2.2 -1.5 -1.8 -1.8 -1.8 -2.3 -2.0 -1.8 -2.0 -2.6 -2.8
-2.0 -1.6 -1.3 -1.0 -.5 -.4 -.9 -1.3 -1.2 -1.4 -2.0 -1.8 -1.5 -.9 -.8 -.4 -.1 .4 .4 .4 .5 .7 .9 .9 .6 .5 .7 .6 .5 .6 .7 .9 1.0 1.1 -.3 -2.0
-.2 -.2 -.2 .3 .4 .4 .1 .5 .7 .5 .1 -.3 -.2 .1 .5 .9 1.0 1.2 1.1 1.0 .9 .9 .9 .8 .8 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.1 .2 -.2

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : HIRS15 channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

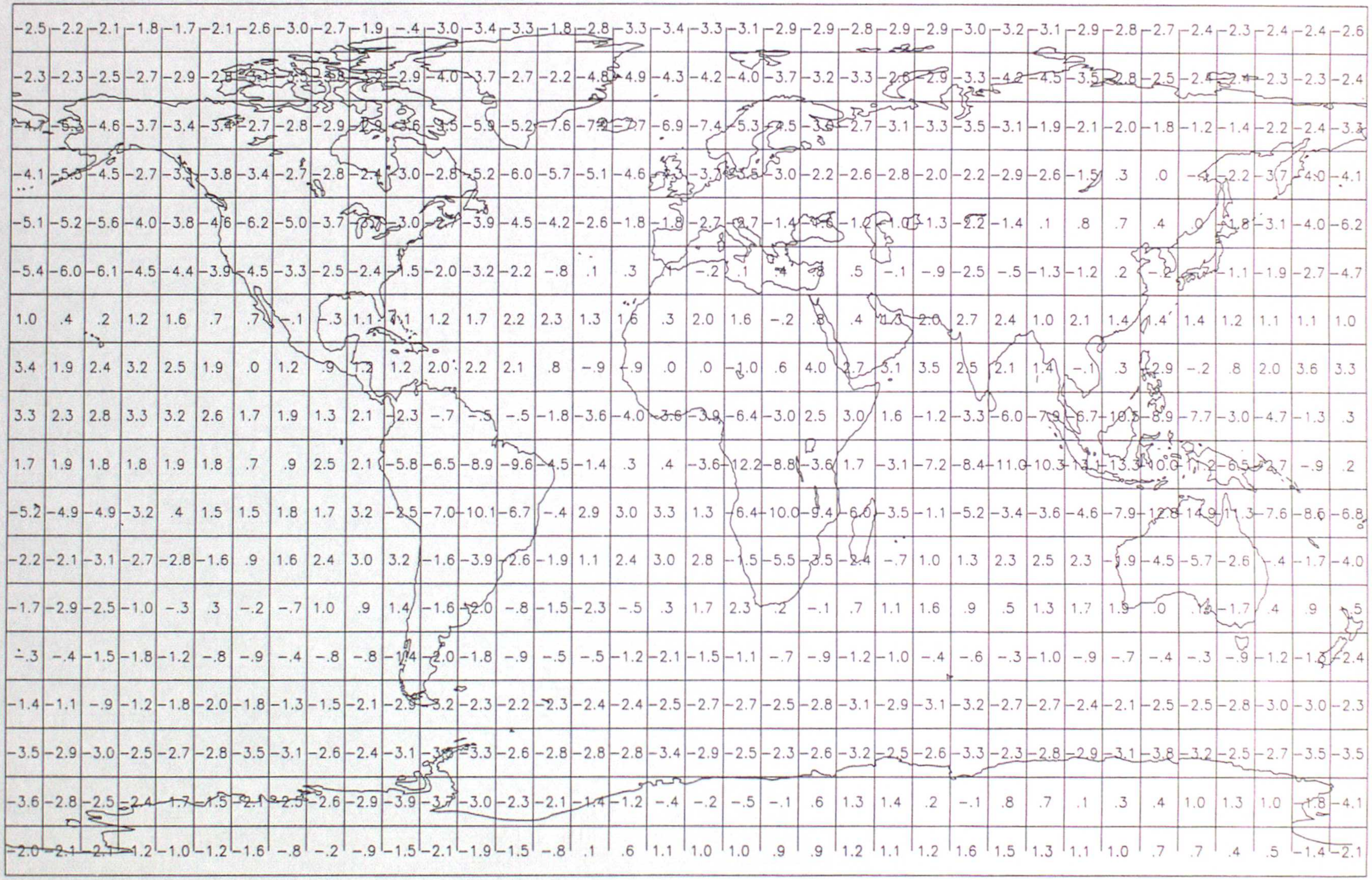
FIGURE 29



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.4 | 1.4 | 1.5 | 1.5 | 1.5 | 1.9 | 2.1 | 2.3 | 2.5 | 2.4 | 2.8 | 3.0 | 3.1 | 3.0 | 2.9 | 3.6 | 3.9 | 3.7 | 3.2 | 3.1 | 2.7 | 2.8 | 2.9 | 2.5 | 2.2 | 2.5 | 2.6 | 2.6 | 2.3 | 1.9 | 2.0 | 1.8 | 1.7 | 1.5 | 1.5 | 1.4 |
| 1.8 | 2.0 | 2.1 | 2.0 | 2.0 | [illegible] | 2.2 | 2.5 | [illegible] | [illegible] | 3.1 | 4.1 | 5.2 | 4.9 | 4.4 | 5.3 | 5.1 | 4.5 | 4.5 | 5.0 | 4.3 | 3.8 | 3.5 | 3.1 | 3.0 | 3.1 | 3.2 | 3.5 | 2.9 | 2.5 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.5 |
| 3.8 | 4.0 | 4.7 | 4.5 | 3.8 | 3.4 | 2.5 | 2.2 | 2.3 | 2.5 | 2.8 | 4.0 | 6.1 | 6.2 | 6.4 | 6.6 | 6.5 | 6.6 | 6.7 | 5.8 | 4.7 | 3.8 | 3.0 | 2.8 | 3.2 | 2.7 | 2.6 | 2.7 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 | 2.2 | 3.0 | 3.5 |
| 3.6 | 4.8 | 5.3 | 4.4 | 4.5 | 4.6 | 4.3 | 3.4 | 3.1 | 2.5 | 2.4 | 3.2 | 4.6 | 4.9 | 5.8 | 6.2 | 6.0 | 6.9 | 5.2 | 5.0 | 3.9 | 3.4 | 3.2 | 3.1 | 2.7 | 2.7 | 3.0 | 3.1 | 2.5 | 1.8 | 1.3 | 1.8 | 2.2 | 3.5 | 3.1 | 3.0 |
| 5.3 | 6.8 | 7.7 | 6.5 | 6.4 | 5.9 | 6.3 | 6.1 | 5.4 | 4.9 | 4.5 | 4.2 | 5.7 | 6.9 | 7.2 | 6.6 | 5.3 | 4.5 | 5.5 | 5.2 | 3.9 | 4.2 | 3.7 | 3.5 | 3.7 | 4.2 | 3.4 | 3.2 | 2.9 | 2.0 | 1.6 | 2.0 | 2.6 | 3.0 | 3.9 | 6.0 |
| 8.4 | 9.0 | 8.7 | 8.2 | 7.7 | 7.2 | 6.9 | 6.0 | 5.6 | 6.6 | 6.4 | 6.7 | 7.2 | 7.3 | 5.9 | 4.2 | 3.8 | 3.0 | 2.7 | 3.0 | 3.0 | 3.4 | 3.9 | 4.3 | 4.3 | 5.1 | 6.0 | 5.4 | 4.6 | 3.9 | 4.1 | 3.9 | 4.0 | 4.5 | 6.4 | 7.2 |
| 5.4 | 5.8 | 5.8 | 4.0 | 3.2 | 5.1 | 4.7 | 4.3 | 4.1 | 4.1 | 4.3 | 4.5 | 3.8 | 3.2 | 2.1 | 2.9 | 3.8 | 5.0 | 2.7 | 2.2 | 4.3 | 4.1 | 4.0 | 2.5 | 2.0 | 2.2 | 3.8 | 3.7 | 2.8 | 3.5 | 3.6 | 4.1 | 4.1 | 4.2 | 5.4 | 5.2 |
| 1.9 | 3.6 | 3.7 | 2.1 | 2.6 | 4.6 | 5.9 | 3.8 | 3.7 | 4.0 | 4.1 | 3.0 | 2.7 | 2.6 | 4.2 | 7.1 | 5.9 | 3.9 | 3.0 | 4.3 | 2.8 | 2.0 | 1.8 | 1.4 | 1.3 | 3.6 | 4.1 | 5.3 | 7.5 | 6.5 | 9.2 | 7.3 | 6.6 | 5.3 | 2.3 | 1.5 |
| 4.3 | 4.4 | 3.1 | 3.2 | 2.8 | 4.5 | 4.7 | 2.7 | 4.9 | 5.2 | 7.6 | 6.8 | 7.2 | 8.0 | 8.2 | 8.5 | 7.9 | 8.8 | 7.1 | 10.1 | 10.4 | 3.7 | 2.0 | 4.2 | 6.3 | 8.3 | 9.7 | 10.2 | 9.6 | 11.2 | 11.3 | 11.6 | 9.3 | 11.5 | 9.9 | 8.7 |
| 5.9 | 5.2 | 5.5 | 4.7 | 4.7 | 4.5 | 4.7 | 4.4 | 3.7 | 4.3 | 9.9 | 9.9 | 11.0 | 12.7 | 9.7 | 8.1 | 5.0 | 5.0 | 8.5 | 13.6 | 12.0 | 10.2 | 4.7 | 9.1 | 11.5 | 11.6 | 11.9 | 11.5 | 11.5 | 10.9 | 11.3 | 11.9 | 10.8 | 9.8 | 7.6 | 6.2 |
| 12.3 | 10.7 | 10.5 | 8.9 | 6.6 | 4.4 | 4.5 | 3.6 | 3.5 | 2.4 | 8.4 | 11.2 | 12.3 | 10.6 | 7.1 | 2.5 | 1.0 | 1.6 | 2.8 | 10.3 | 12.1 | 12.6 | 11.3 | 9.5 | 7.5 | 12.2 | 10.8 | 10.6 | 11.1 | 11.8 | 14.0 | 14.0 | 13.7 | 12.3 | 12.2 | 12.1 |
| 9.3 | 9.1 | 9.2 | 9.3 | 9.9 | 8.2 | 5.4 | 3.5 | 1.8 | 1.2 | 1.1 | 8.3 | 10.9 | 8.8 | 8.6 | 5.8 | 2.5 | 1.6 | 1.3 | 8.5 | 10.8 | 10.0 | 9.4 | 7.2 | 5.8 | 5.1 | 3.0 | 3.0 | 2.7 | 8.7 | 10.4 | 11.1 | 9.2 | 6.1 | 7.8 | 10.4 |
| 7.2 | 7.9 | 8.0 | 6.1 | 5.9 | 5.6 | 5.8 | 6.2 | 3.2 | 3.7 | 4.2 | 8.9 | 7.6 | 6.5 | 7.5 | 7.4 | 5.3 | 5.0 | 3.1 | 1.8 | 5.1 | 5.8 | 5.5 | 4.6 | 4.1 | 4.0 | 3.5 | 3.2 | 2.7 | 3.2 | 6.0 | 5.4 | 6.6 | 5.2 | 4.5 | 6.8 |
| 4.6 | 4.5 | 5.7 | 5.8 | 5.2 | 5.2 | 4.4 | 4.1 | 4.3 | 3.9 | 5.3 | 6.3 | 6.5 | 5.5 | 5.0 | 4.6 | 4.8 | 5.4 | 4.8 | 4.6 | 4.2 | 6.0 | 5.8 | 6.1 | 5.3 | 4.7 | 4.0 | 4.1 | 3.9 | 4.3 | 4.6 | 4.8 | 6.1 | 6.0 | 6.0 | 6.9 |
| 3.9 | 3.7 | 3.5 | 3.4 | 3.8 | 4.2 | 3.7 | 3.4 | 3.7 | 3.9 | 4.4 | 5.0 | 4.6 | 5.0 | 4.8 | 4.2 | 3.7 | 3.9 | 3.6 | 3.4 | 3.6 | 4.2 | 4.7 | 4.6 | 5.3 | 4.8 | 3.9 | 3.5 | 3.3 | 3.4 | 3.8 | 4.4 | 4.7 | 4.7 | 5.1 | 4.6 |
| 3.1 | 3.3 | 3.6 | 2.7 | 2.9 | 3.0 | 3.3 | 3.3 | 3.0 | 2.9 | 3.2 | 3.7 | 3.8 | 3.3 | 3.1 | 2.8 | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.5 | 3.0 | 3.2 | 3.6 | 3.1 | 2.7 | 2.9 | 2.9 | 3.0 | 3.3 | 3.3 | 3.2 | 3.1 | 3.1 | 3.1 |
| 2.1 | 2.1 | 2.2 | 2.3 | 2.4 | 2.6 | 2.8 | 3.0 | 3.3 | 3.3 | 3.5 | 3.6 | 2.8 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.3 | 2.0 | 1.9 | 1.7 | 1.5 | 1.4 | 1.4 | 1.5 | 1.3 | 1.4 | 1.4 | 1.3 | 1.1 | 1.0 | 1.0 | 1.2 | 2.1 | 2.2 |
| 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 2.0 | 1.6 | 1.3 | 1.3 | 1.6 | 1.8 | 1.8 | 1.6 | 1.4 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.2 | 1.2 | 1.0 | .9 | .8 | 1.1 | 1.5 | 1.5 |

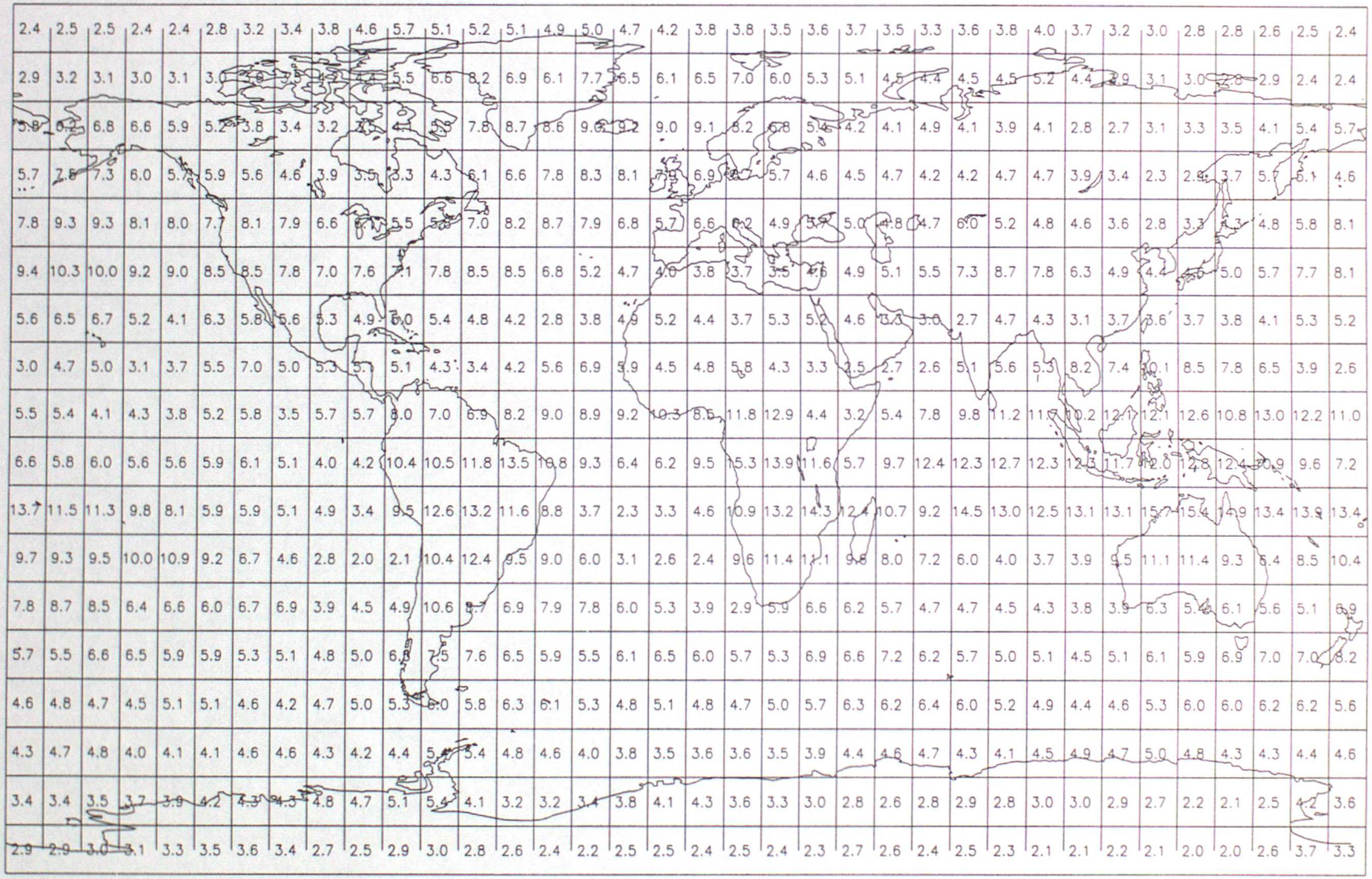
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
FEBRUARY 2000 : HIRS11 Channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 30



ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : HIRS11 channel (500–700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 31

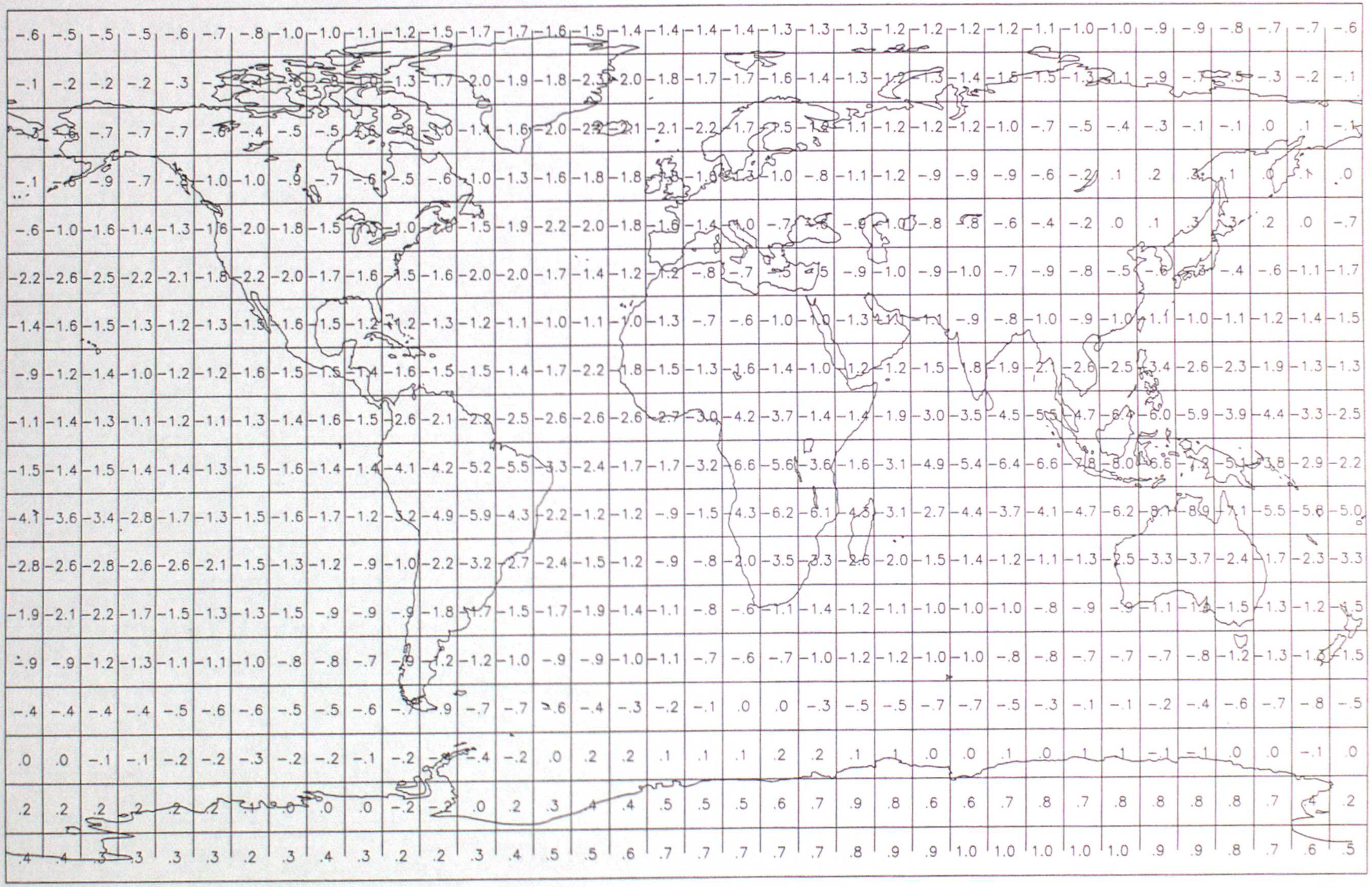

2.4 2.5 2.5 2.4 2.4 2.8 3.2 3.4 3.8 4.6 5.7 5.1 5.2 5.1 4.9 5.0 4.7 4.2 3.8 3.8 3.5 3.6 3.7 3.5 3.3 3.6 3.8 4.0 3.7 3.2 3.0 2.8 2.8 2.6 2.5 2.4
2.9 3.2 3.1 3.0 3.1 3.0 3.8 3.5 4.2 4.4 5.5 6.6 8.2 6.9 6.1 7.7 6.5 6.1 6.5 7.0 6.0 5.3 5.1 4.5 4.4 4.5 4.5 5.2 4.4 3.9 3.1 3.0 2.8 2.9 2.4 2.4
5.8 6.2 6.8 6.6 5.9 5.2 3.8 3.4 3.2 3.5 4.1 5.5 7.8 8.7 8.6 9.6 9.2 9.0 9.1 8.2 6.8 5.4 4.2 4.1 4.9 4.1 3.9 4.1 2.8 2.7 3.1 3.3 3.5 4.1 5.4 5.7
5.7 7.6 7.3 6.0 5.7 5.9 5.6 4.6 3.9 3.5 3.3 4.3 6.1 6.6 7.8 8.3 8.1 7.9 6.9 6.7 5.7 4.6 4.5 4.7 4.2 4.2 4.7 4.7 3.9 3.4 2.3 2.9 3.7 5.7 5.1 4.6
7.8 9.3 9.3 8.1 8.0 7.7 8.1 7.9 6.6 6.1 5.5 5.8 7.0 8.2 8.7 7.9 6.8 5.7 6.6 6.2 4.9 5.7 5.0 4.8 4.7 6.0 5.2 4.8 4.6 3.6 2.8 3.3 4.3 4.8 5.8 8.1
9.4 10.3 10.0 9.2 9.0 8.5 8.5 7.8 7.0 7.6 7.1 7.8 8.5 8.5 6.8 5.2 4.7 4.0 3.8 3.7 3.5 4.6 4.9 5.1 5.5 7.3 8.7 7.8 6.3 4.9 4.4 4.6 5.0 5.7 7.7 8.1
5.6 6.5 6.7 5.2 4.1 6.3 5.8 5.6 5.3 4.9 6.0 5.4 4.8 4.2 2.8 3.8 4.9 5.2 4.4 3.7 5.3 5.2 4.6 3.3 3.0 2.7 4.7 4.3 3.1 3.7 3.6 3.7 3.8 4.1 5.3 5.2
3.0 4.7 5.0 3.1 3.7 5.5 7.0 5.0 5.3 5.1 5.1 4.3 3.4 4.2 5.6 6.9 5.9 4.5 4.8 5.8 4.3 3.3 2.5 2.7 2.6 5.1 5.6 5.3 8.2 7.4 10.1 8.5 7.8 6.5 3.9 2.6
5.5 5.4 4.1 4.3 3.8 5.2 5.8 3.5 5.7 5.7 8.0 7.0 6.9 8.2 9.0 8.9 9.2 10.3 8.5 11.8 12.9 4.4 3.2 5.4 7.8 9.8 11.2 11.7 10.2 12.1 12.1 12.6 10.8 13.0 12.2 11.0
6.6 5.8 6.0 5.6 5.6 5.9 6.1 5.1 4.0 4.2 10.4 10.5 11.8 13.5 10.8 9.3 6.4 6.2 9.5 15.3 13.9 11.6 5.7 9.7 12.4 12.3 12.7 12.3 12.3 11.7 12.0 12.8 12.4 10.9 9.6 7.2
13.7 11.5 11.3 9.8 8.1 5.9 5.9 5.1 4.9 3.4 9.5 12.6 13.2 11.6 8.8 3.7 2.3 3.3 4.6 10.9 13.2 14.3 12.4 10.7 9.2 14.5 13.0 12.5 13.1 13.1 15.7 15.4 14.9 13.4 13.9 13.4
9.7 9.3 9.5 10.0 10.9 9.2 6.7 4.6 2.8 2.0 2.1 10.4 12.4 9.5 9.0 6.0 3.1 2.6 2.4 9.6 11.4 11.1 9.8 8.0 7.2 6.0 4.0 3.7 3.9 9.5 11.1 11.4 9.3 6.4 8.5 10.4
7.8 8.7 8.5 6.4 6.6 6.0 6.7 6.9 3.9 4.5 4.9 10.6 8.7 6.9 7.9 7.8 6.0 5.3 3.9 2.9 5.9 6.6 6.2 5.7 4.7 4.7 4.5 4.3 3.8 3.9 6.3 5.4 6.1 5.6 5.1 6.9
5.7 5.5 6.6 6.5 5.9 5.9 5.3 5.1 4.8 5.0 6.8 7.5 7.6 6.5 5.9 5.5 6.1 6.5 6.0 5.7 5.3 6.9 6.6 7.2 6.2 5.7 5.0 5.1 4.5 5.1 6.1 5.9 6.9 7.0 7.0 8.2
4.6 4.8 4.7 4.5 5.1 5.1 4.6 4.2 4.7 5.0 5.3 6.0 5.8 6.3 6.1 5.3 4.8 5.1 4.8 4.7 5.0 5.7 6.3 6.2 6.4 6.0 5.2 4.9 4.4 4.6 5.3 6.0 6.0 6.2 6.2 5.6
4.3 4.7 4.8 4.0 4.1 4.1 4.6 4.6 4.3 4.2 4.4 5.4 5.4 4.8 4.6 4.0 3.8 3.5 3.6 3.6 3.5 3.9 4.4 4.6 4.7 4.3 4.1 4.5 4.9 4.7 5.0 4.8 4.3 4.3 4.4 4.6
3.4 3.4 3.5 3.7 3.9 4.2 4.3 4.3 4.8 4.7 5.1 5.4 4.1 3.2 3.2 3.4 3.8 4.1 4.3 3.6 3.3 3.0 2.8 2.6 2.8 2.9 2.8 3.0 3.0 2.9 2.7 2.2 2.1 2.5 4.2 3.6
2.9 2.9 3.0 3.1 3.3 3.5 3.6 3.4 2.7 2.5 2.9 3.0 2.8 2.6 2.4 2.2 2.5 2.5 2.4 2.5 2.4 2.3 2.7 2.6 2.4 2.5 2.3 2.1 2.1 2.2 2.1 2.0 2.0 2.6 3.7 3.3

ATOVS : MEAN O−B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

FEBRUARY 2000 : HIRS4 channel (400 hPa)

NOAA−15, USING ALL OBSERVATIONS

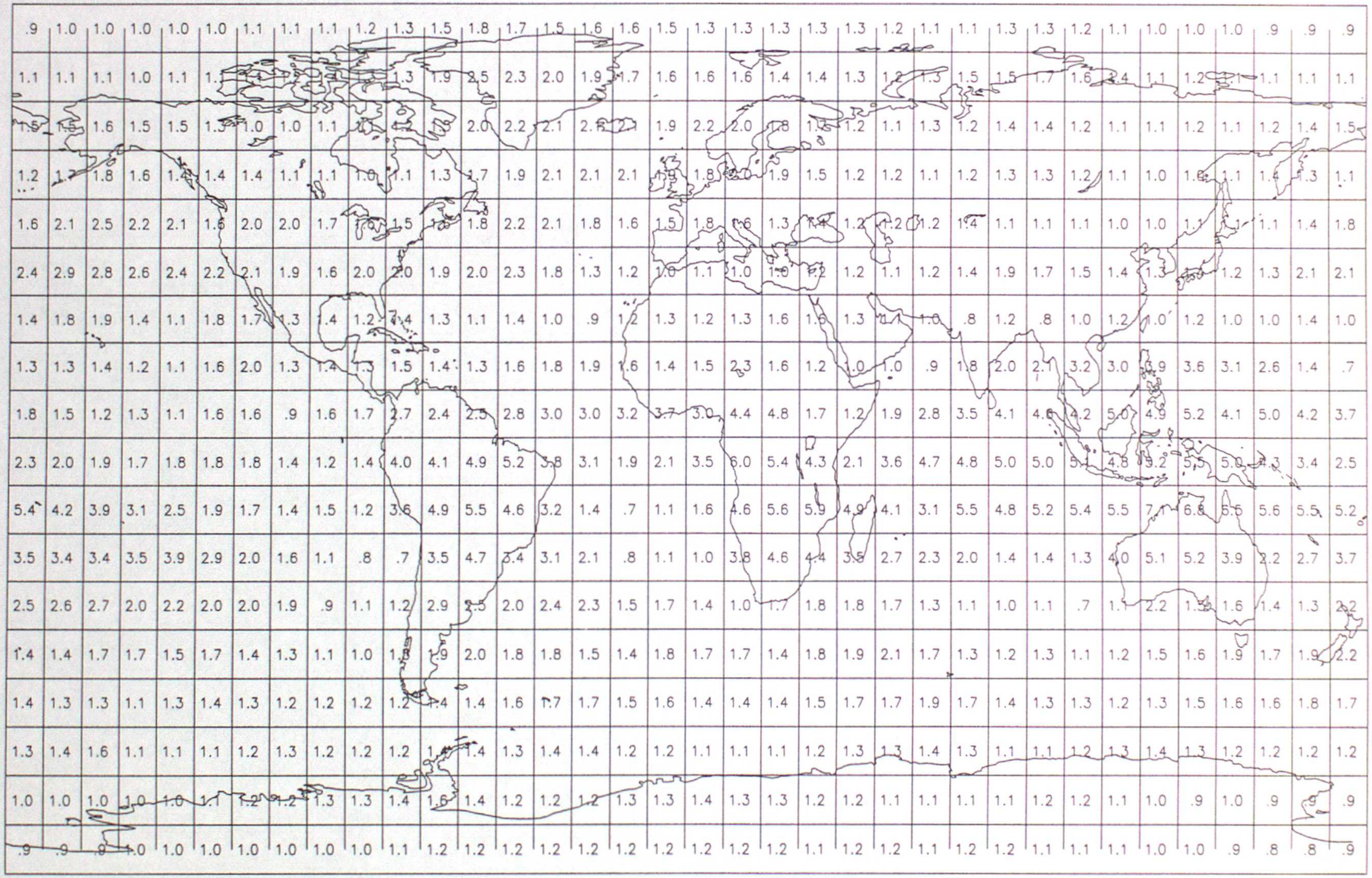
FIGURE 32



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| −.6 | −.5 | −.5 | −.5 | −.6 | −.7 | −.8 | −1.0 | −1.0 | −1.1 | −1.2 | −1.5 | −1.7 | −1.7 | −1.6 | −1.5 | −1.4 | −1.4 | −1.4 | −1.4 | −1.3 | −1.3 | −1.3 | −1.2 | −1.2 | −1.2 | −1.2 | −1.1 | −1.0 | −1.0 | −.9 | −.9 | −.8 | −.7 | −.7 | −.6 |
| −.1 | −.2 | −.2 | −.2 | −.3 | [illegible] | −.4 | −.6 | [illegible] | −1.0 | −1.3 | −1.7 | −2.0 | −1.9 | −1.8 | −2.3 | −2.0 | −1.8 | −1.7 | −1.7 | −1.6 | −1.4 | −1.3 | −1.2 | −1.3 | −1.4 | −1.5 | −1.5 | −1.3 | −1.1 | −.9 | −.7 | −.5 | −.3 | −.2 | −.1 |
| −.3 | −.6 | −.7 | −.7 | −.7 | −.6 | −.4 | −.5 | −.5 | −.6 | −.8 | −1.0 | −1.4 | −1.6 | −2.0 | −2.2 | −2.1 | −2.1 | −2.2 | −1.7 | −1.5 | [illegible] | −1.1 | −1.2 | −1.2 | −1.2 | −1.0 | −.7 | −.5 | −.4 | −.3 | −.1 | −.1 | .0 | .1 | −.1 |
| −.1 | −.6 | −.9 | −.7 | −.8 | −1.0 | −1.0 | −.9 | −.7 | −.6 | −.5 | −.6 | −1.0 | −1.3 | −1.6 | −1.8 | −1.8 | −1.8 | −1.6 | −1.3 | −1.0 | −.8 | −1.1 | −1.2 | −.9 | −.9 | −.9 | −.6 | −.2 | .1 | .2 | .3 | .1 | .0 | .1 | .0 |
| −.6 | −1.0 | −1.6 | −1.4 | −1.3 | −1.6 | −2.0 | −1.8 | −1.5 | [illegible] | −1.0 | −2.0 | −1.5 | −1.9 | −2.2 | −2.0 | −1.8 | −1.6 | −1.4 | −1.0 | −.7 | −.6 | −.9 | −1.0 | −.8 | −.8 | −.6 | −.4 | −.2 | .0 | .1 | .3 | .3 | .2 | .0 | −.7 |
| −2.2 | −2.6 | −2.5 | −2.2 | −2.1 | −1.8 | −2.2 | −2.0 | −1.7 | −1.6 | −1.5 | −1.6 | −2.0 | −2.0 | −1.7 | −1.4 | −1.2 | −1.2 | −.8 | −.7 | −.5 | −.5 | −.9 | −1.0 | −.9 | −1.0 | −.7 | −.9 | −.8 | −.5 | −.6 | −.3 | −.4 | −.6 | −1.1 | −1.7 |
| −1.4 | −1.6 | −1.5 | −1.3 | −1.2 | −1.3 | −1.5 | −1.6 | −1.5 | −1.2 | −1.2 | −1.3 | −1.2 | −1.1 | −1.0 | −1.1 | −1.0 | −1.3 | −.7 | −.6 | −1.0 | −1.0 | −1.3 | −1.1 | −1.1 | −.9 | −.8 | −1.0 | −.9 | −1.0 | −1.1 | −1.0 | −1.1 | −1.2 | −1.4 | −1.5 |
| −.9 | −1.2 | −1.4 | −1.0 | −1.2 | −1.2 | −1.6 | −1.5 | −1.5 | −1.4 | −1.6 | −1.5 | −1.5 | −1.4 | −1.7 | −2.2 | −1.8 | −1.5 | −1.3 | −1.6 | −1.4 | −1.0 | −1.2 | −1.2 | −1.5 | −1.8 | −1.9 | −2.1 | −2.6 | −2.5 | −3.4 | −2.6 | −2.3 | −1.9 | −1.3 | −1.3 |
| −1.1 | −1.4 | −1.3 | −1.1 | −1.2 | −1.1 | −1.3 | −1.4 | −1.6 | −1.5 | −2.6 | −2.1 | −2.2 | −2.5 | −2.6 | −2.6 | −2.6 | −2.7 | −3.0 | −4.2 | −3.7 | −1.4 | −1.4 | −1.9 | −3.0 | −3.5 | −4.5 | −5.5 | −4.7 | −6.4 | −6.0 | −5.9 | −3.9 | −4.4 | −3.3 | −2.5 |
| −1.5 | −1.4 | −1.5 | −1.4 | −1.4 | −1.3 | −1.5 | −1.6 | −1.4 | −1.4 | −4.1 | −4.2 | −5.2 | −5.5 | −3.3 | −2.4 | −1.7 | −1.7 | −3.2 | −6.6 | −5.6 | −3.6 | −1.6 | −3.1 | −4.9 | −5.4 | −6.4 | −6.6 | −7.8 | −8.0 | −6.6 | −7.2 | −5.1 | −3.8 | −2.9 | −2.2 |
| −4.1 | −3.6 | −3.4 | −2.8 | −1.7 | −1.3 | −1.5 | −1.6 | −1.7 | −1.2 | −3.2 | −4.9 | −5.9 | −4.3 | −2.2 | −1.2 | −1.2 | −.9 | −1.5 | −4.3 | −6.2 | −6.1 | −4.3 | −3.1 | −2.7 | −4.4 | −3.7 | −4.1 | −4.7 | −6.2 | −8.1 | −8.9 | −7.1 | −5.5 | −5.8 | −5.0 |
| −2.8 | −2.6 | −2.8 | −2.6 | −2.6 | −2.1 | −1.5 | −1.3 | −1.2 | −.9 | −1.0 | −2.2 | −3.2 | −2.7 | −2.4 | −1.5 | −1.2 | −.9 | −.8 | −2.0 | −3.5 | −3.3 | −2.6 | −2.0 | −1.5 | −1.4 | −1.2 | −1.1 | −1.3 | −2.5 | −3.3 | −3.7 | −2.4 | −1.7 | −2.3 | −3.3 |
| −1.9 | −2.1 | −2.2 | −1.7 | −1.5 | −1.3 | −1.3 | −1.5 | −.9 | −.9 | −.9 | −1.8 | −1.7 | −1.5 | −1.7 | −1.9 | −1.4 | −1.1 | −.8 | −.6 | −1.1 | −1.4 | −1.2 | −1.1 | −1.0 | −1.0 | −1.0 | −.8 | −.9 | −.9 | −1.1 | [illegible] | −1.5 | −1.3 | −1.2 | −1.5 |
| −.9 | −.9 | −1.2 | −1.3 | −1.1 | −1.1 | −1.0 | −.8 | −.8 | −.7 | −.9 | −1.2 | −1.2 | −1.0 | −.9 | −.9 | −1.0 | −1.1 | −.7 | −.6 | −.7 | −1.0 | −1.2 | −1.2 | −1.0 | −1.0 | −.8 | −.8 | −.7 | −.7 | −.7 | −.8 | −1.2 | −1.3 | −1.3 | −1.5 |
| −.4 | −.4 | −.4 | −.4 | −.5 | −.6 | −.6 | −.5 | −.5 | −.6 | −.7 | −.9 | −.7 | −.7 | −.6 | −.4 | −.3 | −.2 | −.1 | .0 | .0 | −.3 | −.5 | −.5 | −.7 | −.7 | −.5 | −.3 | −.1 | −.1 | −.2 | −.4 | −.6 | −.7 | −.8 | −.5 |
| .0 | .0 | −.1 | −.1 | −.2 | −.2 | −.3 | −.2 | −.2 | −.1 | −.2 | −.4 | −.4 | −.2 | .0 | .2 | .2 | .1 | .1 | .1 | .2 | .2 | .1 | .1 | .0 | .0 | .1 | .0 | .1 | .1 | −.1 | −.1 | .0 | .0 | −.1 | .0 |
| .2 | .2 | .2 | .2 | .2 | .2 | .1 | .0 | .0 | .0 | −.2 | −.2 | .0 | .2 | .3 | .4 | .4 | .5 | .5 | .5 | .6 | .7 | .9 | .8 | .6 | .6 | .7 | .8 | .7 | .8 | .8 | .8 | .8 | .7 | .4 | .2 |
| .4 | .4 | .3 | .3 | .3 | .3 | .2 | .3 | .4 | .3 | .2 | .2 | .3 | .4 | .5 | .5 | .6 | .7 | .7 | .7 | .7 | .7 | .8 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .9 | .9 | .8 | .7 | .6 | .5 |

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

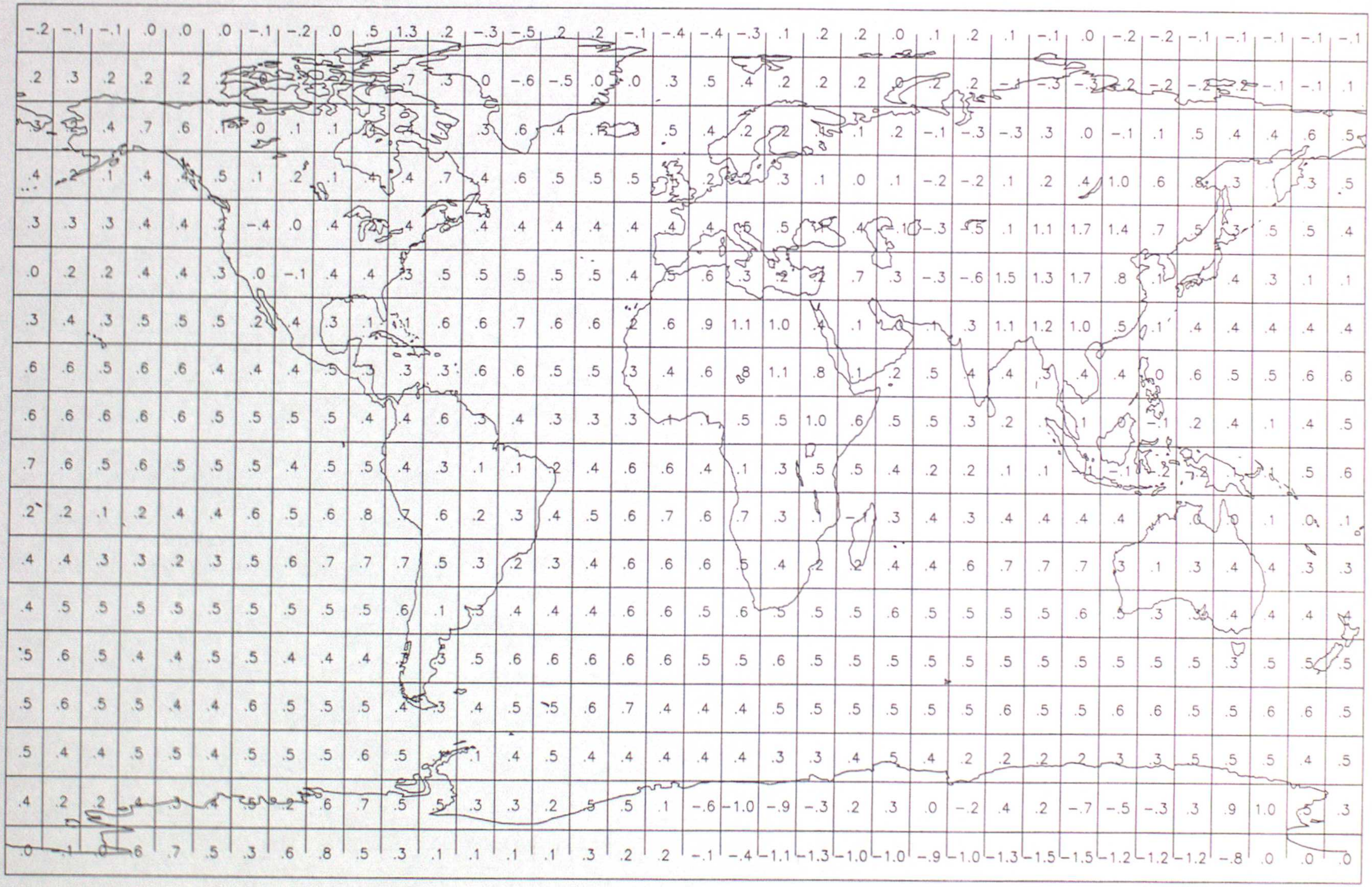
FIGURE 33



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.5 | 1.8 | 1.7 | 1.5 | 1.6 | 1.6 | 1.5 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 1.0 | 1.0 | .9 | .9 | .9 |
| 1.1 | 1.1 | 1.1 | 1.0 | 1.1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1.3 | 1.9 | 2.5 | 2.3 | 2.0 | 1.9 | 1.7 | 1.6 | 1.6 | 1.6 | 1.4 | 1.4 | 1.3 | 1.2 | 1.3 | 1.5 | 1.5 | 1.7 | 1.6 | 2.4 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 |
| 1.5 | 1.5 | 1.6 | 1.5 | 1.5 | 1.3 | 1.0 | 1.0 | 1.1 | [illegible] | [illegible] | [illegible] | 2.0 | 2.2 | 2.1 | 2.1 | 2.1 | 1.9 | 2.2 | 2.0 | 1.8 | 1.5 | 1.2 | 1.1 | 1.3 | 1.2 | 1.4 | 1.4 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.4 | 1.5 |
| 1.2 | 1.7 | 1.8 | 1.6 | 1.4 | 1.4 | 1.4 | 1.1 | 1.1 | 1.0 | 1.1 | 1.3 | 1.7 | 1.9 | 2.1 | 2.1 | 2.1 | 1.9 | 1.8 | 2.0 | 1.9 | 1.5 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 1.6 | 1.1 | 1.4 | 1.3 | 1.1 |
| 1.6 | 2.1 | 2.5 | 2.2 | 2.1 | 1.6 | 2.0 | 2.0 | 1.7 | [illegible] | 1.5 | [illegible] | 1.8 | 2.2 | 2.1 | 1.8 | 1.6 | 1.5 | 1.8 | 1.6 | 1.3 | 1.4 | 1.2 | 1.2 | 1.2 | 1.4 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.4 | 1.8 |
| 2.4 | 2.9 | 2.8 | 2.6 | 2.4 | 2.2 | 2.1 | 1.9 | 1.6 | 2.0 | 2.0 | 1.9 | 2.0 | 2.3 | 1.8 | 1.3 | 1.2 | 1.0 | 1.1 | 1.0 | 1.0 | 1.2 | 1.2 | 1.1 | 1.2 | 1.4 | 1.9 | 1.7 | 1.5 | 1.4 | 1.3 | [illegible] | 1.2 | 1.3 | 2.1 | 2.1 |
| 1.4 | 1.8 | 1.9 | 1.4 | 1.1 | 1.8 | 1.7 | 1.3 | 1.4 | 1.2 | 1.4 | 1.3 | 1.1 | 1.4 | 1.0 | .9 | 1.2 | 1.3 | 1.2 | 1.3 | 1.6 | 1.6 | 1.3 | 1.1 | 1.0 | .8 | 1.2 | .8 | 1.0 | 1.2 | 1.0 | 1.2 | 1.0 | 1.0 | 1.4 | 1.0 |
| 1.3 | 1.3 | 1.4 | 1.2 | 1.1 | 1.6 | 2.0 | 1.3 | 1.4 | 1.3 | 1.5 | 1.4 | 1.3 | 1.6 | 1.8 | 1.9 | 1.6 | 1.4 | 1.5 | 2.3 | 1.6 | 1.2 | 1.0 | 1.0 | .9 | 1.8 | 2.0 | 2.1 | 3.2 | 3.0 | 3.9 | 3.6 | 3.1 | 2.6 | 1.4 | .7 |
| 1.8 | 1.5 | 1.2 | 1.3 | 1.1 | 1.6 | 1.6 | .9 | 1.6 | 1.7 | 2.7 | 2.4 | 2.5 | 2.8 | 3.0 | 3.0 | 3.2 | 3.7 | 3.0 | 4.4 | 4.8 | 1.7 | 1.2 | 1.9 | 2.8 | 3.5 | 4.1 | 4.6 | 4.2 | 5.0 | 4.9 | 5.2 | 4.1 | 5.0 | 4.2 | 3.7 |
| 2.3 | 2.0 | 1.9 | 1.7 | 1.8 | 1.8 | 1.8 | 1.4 | 1.2 | 1.4 | 4.0 | 4.1 | 4.9 | 5.2 | 3.8 | 3.1 | 1.9 | 2.1 | 3.5 | 6.0 | 5.4 | 4.3 | 2.1 | 3.6 | 4.7 | 4.8 | 5.0 | 5.0 | 5.1 | 4.8 | 5.2 | 5.5 | 5.0 | 4.3 | 3.4 | 2.5 |
| 5.4 | 4.2 | 3.9 | 3.1 | 2.5 | 1.9 | 1.7 | 1.4 | 1.5 | 1.2 | 3.6 | 4.9 | 5.5 | 4.6 | 3.2 | 1.4 | .7 | 1.1 | 1.6 | 4.6 | 5.6 | 5.9 | 4.9 | 4.1 | 3.1 | 5.5 | 4.8 | 5.2 | 5.4 | 5.5 | 7.1 | 6.8 | 5.5 | 5.6 | 5.5 | 5.2 |
| 3.5 | 3.4 | 3.4 | 3.5 | 3.9 | 2.9 | 2.0 | 1.6 | 1.1 | .8 | .7 | 3.5 | 4.7 | 3.4 | 3.1 | 2.1 | .8 | 1.1 | 1.0 | 3.8 | 4.6 | 4.4 | 3.5 | 2.7 | 2.3 | 2.0 | 1.4 | 1.4 | 1.3 | 4.0 | 5.1 | 5.2 | 3.9 | 2.2 | 2.7 | 3.7 |
| 2.5 | 2.6 | 2.7 | 2.0 | 2.2 | 2.0 | 2.0 | 1.9 | .9 | 1.1 | 1.2 | 2.9 | 2.5 | 2.0 | 2.4 | 2.3 | 1.5 | 1.7 | 1.4 | 1.0 | 1.7 | 1.8 | 1.8 | 1.7 | 1.3 | 1.1 | 1.0 | 1.1 | .7 | 1.1 | 2.2 | 1.5 | 1.6 | 1.4 | 1.3 | 2.2 |
| 1.4 | 1.4 | 1.7 | 1.7 | 1.5 | 1.7 | 1.4 | 1.3 | 1.1 | 1.0 | 1.8 | 1.9 | 2.0 | 1.8 | 1.8 | 1.5 | 1.4 | 1.8 | 1.7 | 1.7 | 1.4 | 1.8 | 1.9 | 2.1 | 1.7 | 1.3 | 1.2 | 1.3 | 1.1 | 1.2 | 1.5 | 1.6 | 1.9 | 1.7 | 1.9 | 2.2 |
| 1.4 | 1.3 | 1.3 | 1.1 | 1.3 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.4 | 1.4 | 1.6 | 1.7 | 1.7 | 1.5 | 1.6 | 1.4 | 1.4 | 1.4 | 1.5 | 1.7 | 1.7 | 1.9 | 1.7 | 1.4 | 1.3 | 1.3 | 1.2 | 1.3 | 1.5 | 1.6 | 1.6 | 1.8 | 1.7 |
| 1.3 | 1.4 | 1.6 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.2 | 1.2 | 1.4 | 1.4 | 1.3 | 1.4 | 1.4 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.4 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 |
| 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 1.3 | 1.3 | 1.4 | 1.6 | 1.4 | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.0 | .9 | 1.0 | .9 | .9 | .9 |
| .9 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | .9 | .8 | .8 | .9 |

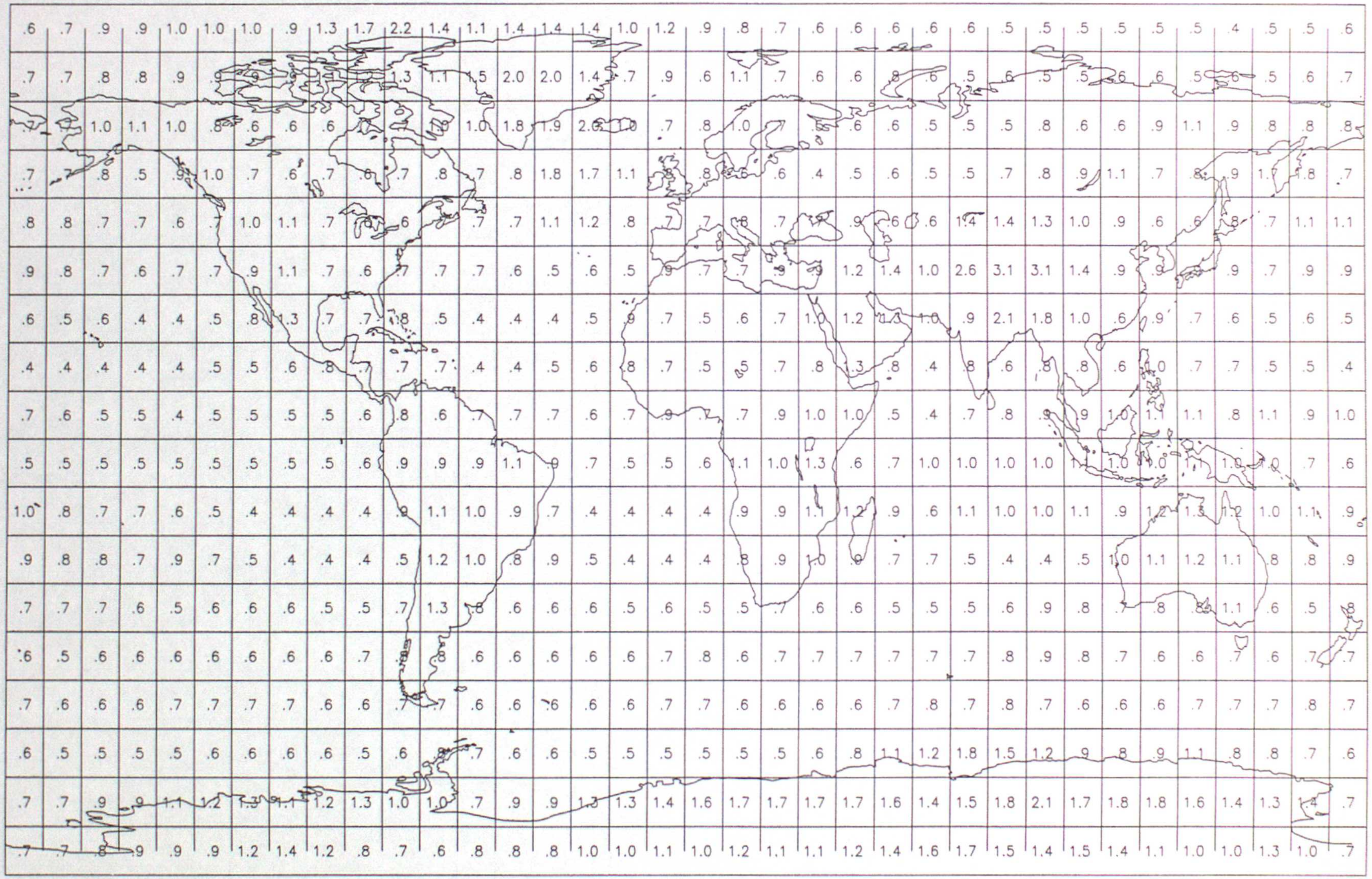
ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
FEBRUARY 2000 : AMSUA–5 Channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 34


–.2 –.1 –.1 .0 .0 .0 –.1 –.2 .0 .5 1.3 .2 –.3 –.5 .2 .2 –.1 –.4 –.4 –.3 .1 .2 .2 .0 .1 .2 .1 –.1 .0 –.2 –.2 –.1 –.1 –.1 –.1 –.1
.2 .3 .2 .2 .2 .2 .7 .3 0 –.6 –.5 .0 .0 .3 .5 .4 .2 .2 .2 .0 .2 .2 –.1 –.3 –.3 .2 –.2 –.2 .2 –.1 –.1 .1
.3 .2 .4 .7 .6 .1 .0 .1 .1 .3 .6 .4 .1 .3 .5 .4 .2 .2 .1 .1 .2 –.1 –.3 –.3 .3 .0 –.1 .1 .5 .4 .4 .6 .5
.4 .2 .1 .4 .4 .5 .1 .2 .1 .4 .4 .7 .4 .6 .5 .5 .5 .2 .2 .3 .1 .0 .1 –.2 –.2 .1 .2 .4 1.0 .6 .8 .3 .3 .5
.3 .3 .3 .4 .4 .2 –.4 .0 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .1 .4 –.1 –.3 –.5 .1 1.1 1.7 1.4 .7 .5 .3 .5 .5 .4
.0 .2 .2 .4 .4 .3 .0 –.1 .4 .4 .3 .5 .5 .5 .5 .5 .4 .5 .6 .3 .2 .2 .7 .3 –.3 –.6 1.5 1.3 1.7 .8 .1 .4 .3 .1 .1
.3 .4 .3 .5 .5 .5 .2 .4 .3 .1 .1 .6 .6 .7 .6 .6 .2 .6 .9 1.1 1.0 .4 .1 .0 .1 .3 1.1 1.2 1.0 .5 .1 .4 .4 .4 .4 .4
.6 .6 .5 .6 .6 .4 .4 .4 .5 .3 .3 .3 .6 .6 .5 .5 .3 .4 .6 .8 1.1 .8 .1 .2 .5 .4 .4 .3 .4 .4 .0 .6 .5 .5 .6 .6
.6 .6 .6 .6 .6 .5 .5 .5 .5 .4 .4 .6 .3 .4 .3 .3 .3 .1 .1 .5 .5 1.0 .6 .5 .5 .3 .2 .1 .0 –.1 .2 .4 .1 .4 .5
.7 .6 .5 .6 .5 .5 .5 .4 .5 .5 .4 .3 .1 .1 .2 .4 .6 .6 .4 .1 .3 .5 .5 .4 .2 .2 .1 .1 –.1 –.1 .2 .2 .1 .1 .5 .6
.2 .2 .1 .2 .4 .4 .6 .5 .6 .8 .7 .6 .2 .3 .4 .5 .6 .7 .6 .7 .3 .1 –.1 .3 .4 .3 .4 .4 .4 .4 .1 .0 .0 .1 .0 .1
.4 .4 .3 .3 .2 .3 .5 .6 .7 .7 .7 .5 .3 .2 .3 .4 .6 .6 .6 .5 .4 .2 .2 .4 .4 .6 .7 .7 .7 .3 .1 .3 .4 .4 .3 .3
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .1 .3 .4 .4 .4 .6 .6 .5 .6 .5 .5 .5 .6 .5 .5 .5 .5 .6 .5 .3 .3 .4 .4 .4 .4
.5 .6 .5 .4 .4 .5 .5 .4 .4 .4 .3 .3 .5 .6 .6 .6 .6 .6 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .3 .5 .5 .5
.5 .6 .5 .5 .4 .4 .6 .5 .5 .5 .4 .3 .4 .5 .5 .6 .7 .4 .4 .4 .5 .5 .5 .5 .5 .5 .6 .5 .5 .6 .6 .5 .5 .6 .6 .5
.5 .4 .4 .5 .5 .4 .5 .5 .5 .6 .5 .1 .4 .5 .4 .4 .4 .4 .4 .3 .3 .4 .5 .4 .2 .2 .2 .2 .3 .3 .5 .5 .5 .4 .5
.4 .2 .2 .4 .3 .4 .5 .2 .6 .7 .5 .5 .3 .3 .2 .5 .5 .1 –.6 –1.0 –.9 –.3 .2 .3 .0 –.2 .4 .2 –.7 –.5 –.3 .3 .9 1.0 .5 .3
.0 –.1 .0 .6 .7 .5 .3 .6 .8 .5 .3 .1 .1 .1 .1 .3 .2 .2 –.1 –.4 –1.1 –1.3 –1.0 –1.0 –.9 –1.0 –1.3 –1.5 –1.5 –1.2 –1.2 –1.2 –.8 .0 .0 .0

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : AMSUA–5 channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

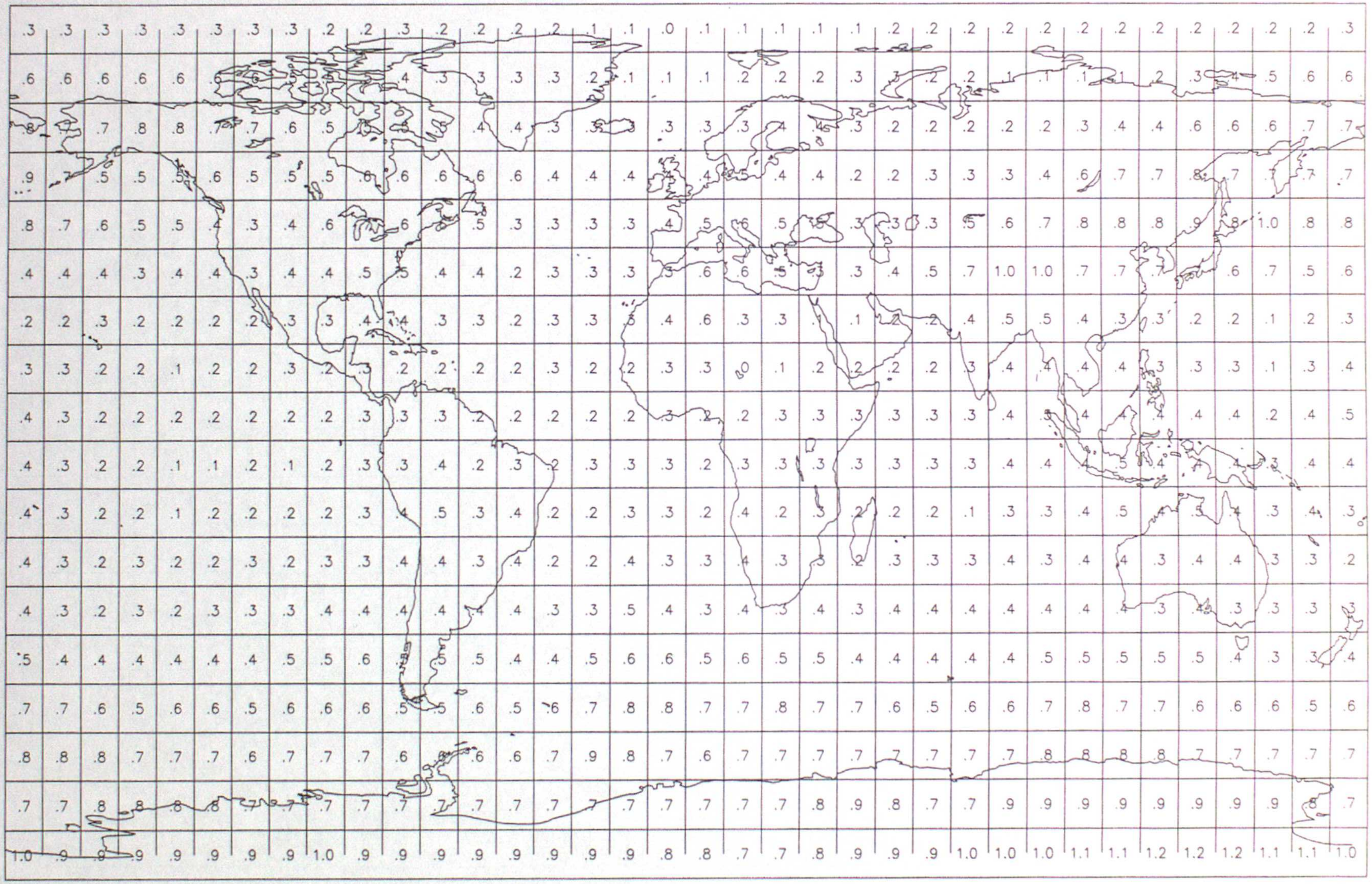
FIGURE 35


.6 .7 .9 .9 1.0 1.0 1.0 .9 1.3 1.7 2.2 1.4 1.1 1.4 1.4 1.4 1.0 1.2 .9 .8 .7 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .4 .5 .5 .6
.7 .7 .8 .8 .9 .9 .9 .9 [illegible] [illegible] 1.3 1.1 1.5 2.0 2.0 1.4 .7 .9 .6 1.1 .7 .6 .6 .8 .6 .5 .6 .5 .5 .6 .6 .5 .6 .5 .6 .7
.7 .7 1.0 1.1 1.0 .8 .6 .6 .6 .7 .7 1.0 1.0 1.8 1.9 2.0 1.0 .7 .8 1.0 .7 .5 .6 .6 .5 .5 .5 .8 .6 .6 .9 1.1 .9 .8 .8 .8
.7 .7 .8 .5 .9 1.0 .7 .6 .7 .6 .7 .8 .7 .8 1.8 1.7 1.1 .8 .8 .6 .6 .4 .5 .6 .5 .5 .7 .8 .9 1.1 .7 .8 .9 1.7 1.8 .7
.8 .8 .7 .7 .6 .7 1.0 1.1 .7 [illegible] .6 [illegible] .7 .7 1.1 1.2 .8 .7 .7 .8 .7 .7 .9 .6 .6 1.4 1.4 1.3 1.0 .9 .6 .6 .8 .7 1.1 1.1
.9 .8 .7 .6 .7 .7 .9 1.1 .7 .6 .7 .7 .7 .6 .5 .6 .5 .9 .7 .7 .9 .9 1.2 1.4 1.0 2.6 3.1 3.1 1.4 .9 .9 .9 .9 .7 .9 .9
.6 .5 .6 .4 .4 .5 .8 1.3 .7 .7 .8 .5 .4 .4 .4 .5 .9 .7 .5 .6 .7 1.0 1.2 1.3 1.0 .9 2.1 1.8 1.0 .6 .9 .7 .6 .5 .6 .5
.4 .4 .4 .4 .4 .5 .5 .6 .8 .7 .7 .7 .4 .4 .5 .6 .8 .7 .5 .5 .7 .8 1.3 .8 .4 .8 .6 .8 .8 .6 1.0 .7 .7 .5 .5 .4
.7 .6 .5 .5 .4 .5 .5 .5 .5 .6 .8 .6 .7 .7 .7 .6 .7 .9 .7 .7 .9 1.0 1.0 .5 .4 .7 .8 .9 .9 1.0 1.1 1.1 .8 1.1 .9 1.0
.5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .9 .9 .9 1.1 .9 .7 .5 .5 .6 1.1 1.0 1.3 .6 .7 1.0 1.0 1.0 1.0 1.1 1.0 1.0 1.1 1.0 1.0 .7 .6
1.0 .8 .7 .7 .6 .5 .4 .4 .4 .4 .9 1.1 1.0 .9 .7 .4 .4 .4 .4 .9 .9 1.1 1.2 .9 .6 1.1 1.0 1.0 1.1 .9 1.2 1.3 1.2 1.0 1.1 .9
.9 .8 .8 .7 .9 .7 .5 .4 .4 .4 .5 1.2 1.0 .8 .9 .5 .4 .4 .4 .8 .9 1.0 .9 .7 .7 .5 .4 .4 .5 1.0 1.1 1.2 1.1 .8 .8 .9
.7 .7 .7 .6 .5 .6 .6 .6 .5 .5 .7 1.3 .8 .6 .6 .6 .5 .6 .5 .5 .7 .6 .6 .5 .5 .5 .6 .9 .8 .7 .8 .8 1.1 .6 .5 .8
.6 .5 .6 .6 .6 .6 .6 .6 .6 .7 .8 .8 .6 .6 .6 .6 .6 .7 .8 .6 .7 .7 .7 .7 .7 .7 .8 .9 .8 .7 .6 .6 .7 .6 .7 .7
.7 .6 .6 .6 .7 .7 .7 .7 .6 .6 .7 .7 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .7 .8 .7 .8 .7 .6 .6 .6 .7 .7 .7 .8 .7
.6 .5 .5 .5 .5 .6 .6 .6 .6 .5 .6 .8 .7 .6 .6 .5 .5 .5 .5 .5 .5 .6 .8 1.1 1.2 1.8 1.5 1.2 .9 .8 .9 1.1 .8 .8 .7 .6
.7 .7 .9 .9 1.1 1.2 1.3 1.1 1.2 1.3 1.0 1.0 .7 .9 .9 1.3 1.3 1.4 1.6 1.7 1.7 1.7 1.7 1.6 1.4 1.5 1.8 2.1 1.7 1.8 1.8 1.6 1.4 1.3 1.4 .7
.7 .7 .8 .9 .9 .9 1.2 1.4 1.2 .8 .7 .6 .8 .8 .8 1.0 1.0 1.1 1.0 1.2 1.1 1.1 1.2 1.4 1.6 1.7 1.5 1.4 1.5 1.4 1.1 1.0 1.0 1.3 1.0 .7

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

FIGURE 36

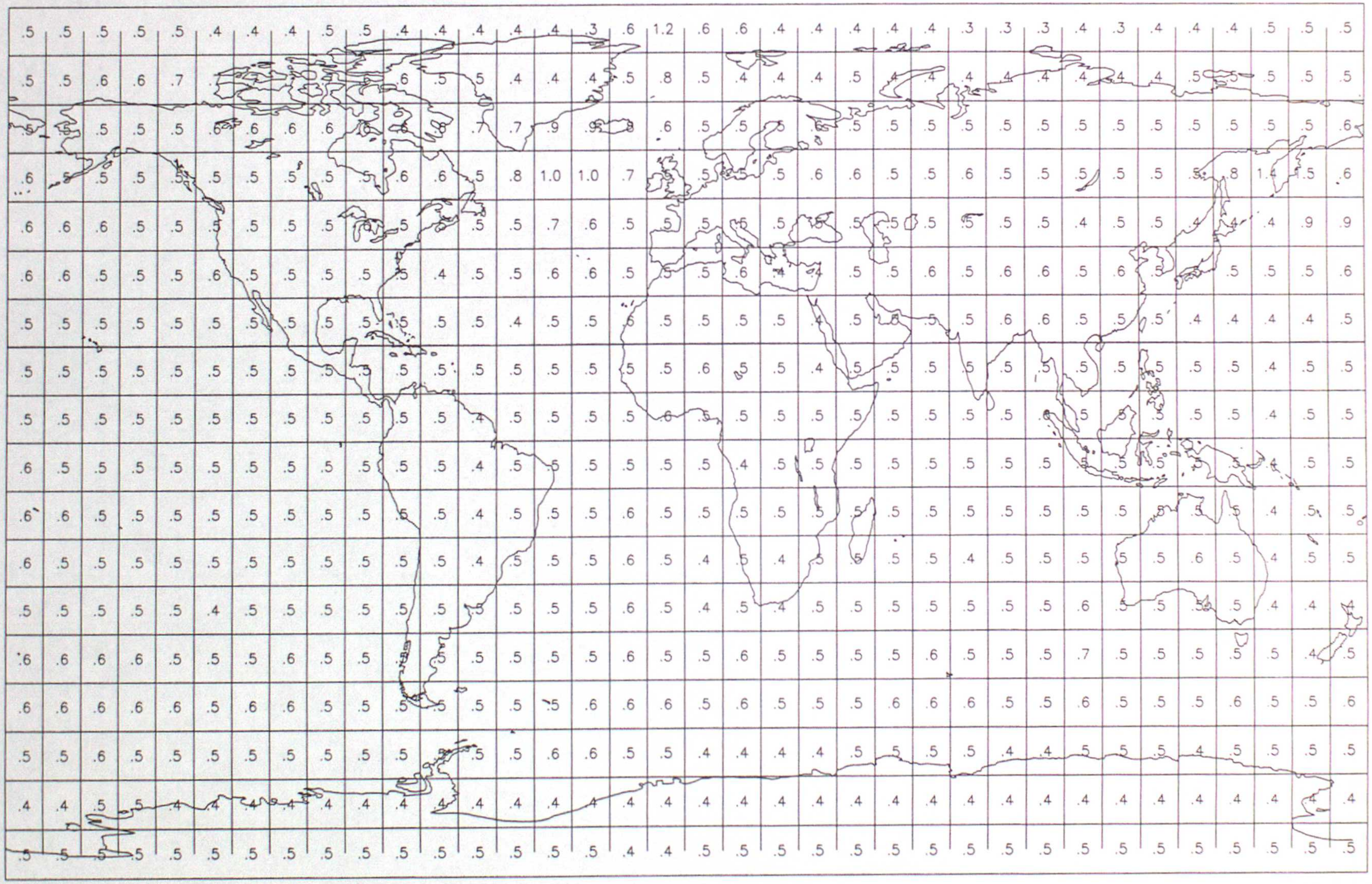
FEBRUARY 2000 : AMSUA–7 Channel (300 hPa)
NOAA–15, USING ALL OBSERVATIONS



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .2 | .2 | .3 | .2 | .2 | .2 | .2 | .1 | .1 | .0 | .1 | .1 | .1 | .1 | .1 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .3 |
| .6 | .6 | .6 | .6 | .6 | .6 | .6 | [illegible] | [illegible] | [illegible] | .4 | .3 | .3 | .3 | .3 | .2 | .1 | .1 | .1 | .2 | .2 | .2 | .3 | .3 | .2 | .2 | .1 | .1 | .1 | .1 | .2 | .3 | .4 | .5 | .6 | .6 |
| .8 | .7 | .7 | .8 | .8 | .7 | .7 | .6 | .5 | .5 | .6 | .5 | .4 | .4 | .3 | .3 | .3 | .3 | .3 | .3 | .4 | .4 | .3 | .2 | .2 | .2 | .2 | .2 | .3 | .4 | .4 | .6 | .6 | .6 | .7 | .7 |
| .9 | .7 | .5 | .5 | .5 | .6 | .5 | .5 | .5 | .6 | .6 | .6 | .6 | .6 | .4 | .4 | .4 | .4 | .4 | .5 | .4 | .4 | .2 | .2 | .3 | .3 | .3 | .4 | .6 | .7 | .7 | .8 | .7 | .7 | .7 | .7 |
| .8 | .7 | .6 | .5 | .5 | .4 | .3 | .4 | .6 | | .6 | | .5 | .3 | .3 | .3 | .3 | .4 | .5 | .6 | .5 | .5 | .3 | .3 | .3 | .5 | .6 | .7 | .8 | .8 | .8 | .9 | .8 | 1.0 | .8 | .8 |
| .4 | .4 | .4 | .3 | .4 | .4 | .3 | .4 | .4 | .5 | .5 | .4 | .4 | .2 | .3 | .3 | .3 | .3 | .6 | .6 | .5 | .3 | .3 | .4 | .5 | .7 | 1.0 | 1.0 | .7 | .7 | .7 | | .6 | .7 | .5 | .6 |
| .2 | .2 | .3 | .2 | .2 | .2 | .2 | .3 | .3 | .4 | .4 | .3 | .3 | .2 | .3 | .3 | .3 | .4 | .6 | .3 | .3 | .1 | .1 | .2 | .2 | .4 | .5 | .5 | .4 | .3 | .3 | .2 | .2 | .1 | .2 | .3 |
| .3 | .3 | .2 | .2 | .1 | .2 | .2 | .3 | .2 | .3 | .2 | .2 | .2 | .2 | .3 | .2 | .2 | .3 | .3 | .0 | .1 | .2 | .2 | .2 | .2 | .3 | .4 | .4 | .4 | .4 | .3 | .3 | .3 | .1 | .3 | .4 |
| .4 | .3 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .3 | .3 | .3 | .2 | .2 | .2 | .2 | .2 | .3 | .2 | .2 | .3 | .3 | .3 | .3 | .3 | .3 | .4 | .5 | .4 | .4 | .4 | .4 | .4 | .2 | .4 | .5 |
| .4 | .3 | .2 | .2 | .1 | .1 | .2 | .1 | .2 | .3 | .3 | .4 | .2 | .3 | .2 | .3 | .3 | .3 | .2 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .4 | .4 | .4 | .5 | .4 | .4 | .4 | .3 | .4 | .4 |
| .4 | .3 | .2 | .2 | .1 | .2 | .2 | .2 | .2 | .3 | .4 | .5 | .3 | .4 | .2 | .2 | .3 | .3 | .2 | .4 | .2 | .3 | .2 | .2 | .2 | .1 | .3 | .3 | .4 | .5 | .4 | .5 | .4 | .3 | .4 | .3 |
| .4 | .3 | .2 | .3 | .2 | .2 | .3 | .2 | .3 | .3 | .4 | .4 | .3 | .4 | .2 | .2 | .4 | .3 | .3 | .4 | .3 | .3 | .2 | .3 | .3 | .3 | .4 | .3 | .4 | .4 | .3 | .4 | .4 | .3 | .3 | .2 |
| .4 | .3 | .2 | .3 | .2 | .3 | .3 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .3 | .5 | .4 | .3 | .4 | .3 | .4 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .4 | .3 | .3 | .3 | .3 |
| .5 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .6 | .5 | .5 | .5 | .4 | .4 | .5 | .6 | .6 | .5 | .6 | .5 | .5 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .5 | .5 | .5 | .4 | .3 | .3 | .4 |
| .7 | .7 | .6 | .5 | .6 | .6 | .5 | .6 | .6 | .6 | .5 | .5 | .6 | .5 | .6 | .7 | .8 | .8 | .7 | .7 | .8 | .7 | .7 | .6 | .5 | .6 | .6 | .7 | .8 | .7 | .7 | .6 | .6 | .6 | .5 | .6 |
| .8 | .8 | .8 | .7 | .7 | .7 | .6 | .7 | .7 | .7 | .6 | .6 | .6 | .6 | .7 | .9 | .8 | .7 | .6 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .8 | .8 | .8 | .8 | .7 | .7 | .7 | .7 | .7 |
| .7 | .7 | .8 | .8 | .8 | .8 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .8 | .9 | .8 | .7 | .7 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | .8 | .7 |
| 1.0 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | 1.0 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | .8 | .8 | .7 | .7 | .8 | .9 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |

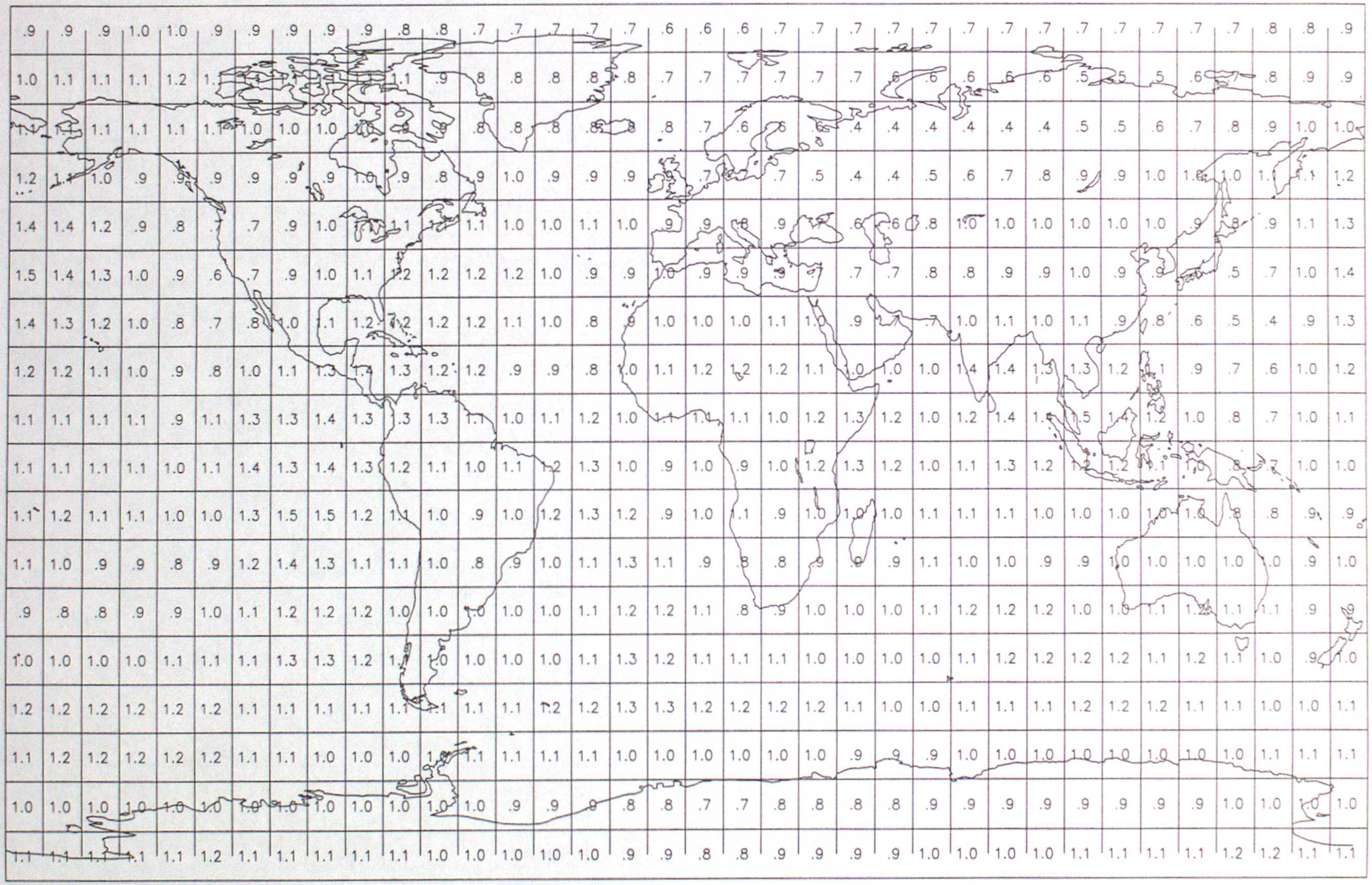
ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : AMSUA–7 channel (300 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 37



ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
FEBRUARY 2000 : AMSUA-9 Channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

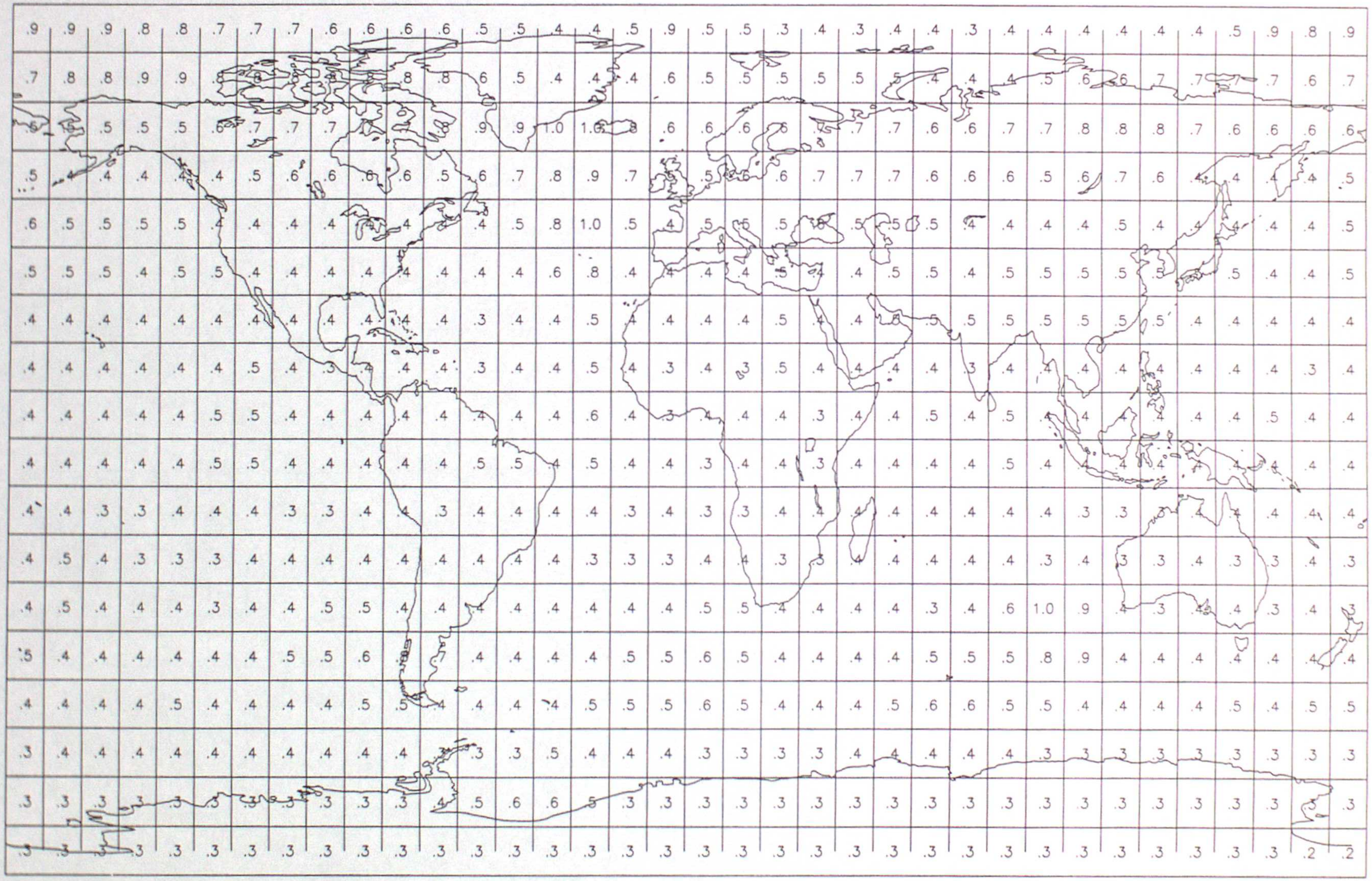
FIGURE 38



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .9 | .9 | .9 | 1.0 | 1.0 | .9 | .9 | .9 | .9 | .9 | .8 | .8 | .7 | .7 | .7 | .7 | .7 | .6 | .6 | .6 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .8 | .8 | .9 |
| 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | [illegible] | [illegible] | 1.1 | [illegible] | [illegible] | 1.1 | .9 | .8 | .8 | .8 | .8 | .8 | .7 | .7 | .7 | .7 | .7 | .7 | .6 | .6 | .6 | .6 | .6 | .5 | .5 | .5 | .6 | .7 | .8 | .9 | .9 |
| 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | .8 | .8 | .8 | .8 | .8 | .8 | .8 | .8 | .7 | .6 | .6 | .6 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .6 | .7 | .8 | .9 | 1.0 | 1.0 |
| 1.2 | 1.1 | 1.0 | .9 | .9 | .9 | .9 | .9 | .9 | 1.0 | .9 | .8 | .9 | 1.0 | .9 | .9 | .9 | .9 | .7 | .7 | .7 | .5 | .4 | .4 | .5 | .6 | .7 | .8 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 |
| 1.4 | 1.4 | 1.2 | .9 | .8 | .7 | .7 | .9 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.1 | 1.0 | .9 | .9 | .8 | .9 | .7 | .6 | .6 | .8 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .9 | .8 | .9 | 1.1 | 1.3 |
| 1.5 | 1.4 | 1.3 | 1.0 | .9 | .6 | .7 | .9 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.0 | .9 | .9 | 1.0 | .9 | .9 | .9 | .7 | .7 | .7 | .8 | .8 | .9 | .9 | 1.0 | .9 | .9 | [illegible] | .5 | .7 | 1.0 | 1.4 |
| 1.4 | 1.3 | 1.2 | 1.0 | .8 | .7 | .8 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.0 | .8 | .9 | 1.0 | 1.0 | 1.0 | 1.1 | 1.0 | .9 | .7 | .7 | 1.0 | 1.1 | 1.0 | 1.1 | .9 | .8 | .6 | .5 | .4 | .9 | 1.3 |
| 1.2 | 1.2 | 1.1 | 1.0 | .9 | .8 | 1.0 | 1.1 | 1.3 | 1.4 | 1.3 | 1.2 | 1.2 | .9 | .9 | .8 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.0 | 1.0 | 1.0 | 1.4 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | .9 | .7 | .6 | 1.0 | 1.2 |
| 1.1 | 1.1 | 1.1 | 1.1 | .9 | 1.1 | 1.3 | 1.3 | 1.4 | 1.3 | 1.3 | 1.3 | 1.1 | 1.0 | 1.1 | 1.2 | 1.0 | 1.1 | 1.1 | 1.1 | 1.0 | 1.2 | 1.3 | 1.2 | 1.0 | 1.2 | 1.4 | 1.4 | 1.5 | 1.4 | 1.2 | 1.0 | .8 | .7 | 1.0 | 1.1 |
| 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.1 | 1.4 | 1.3 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 1.1 | 1.2 | 1.3 | 1.0 | .9 | 1.0 | .9 | 1.0 | 1.2 | 1.3 | 1.2 | 1.0 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.0 | .8 | .7 | 1.0 | 1.0 |
| 1.1 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 | 1.3 | 1.5 | 1.5 | 1.2 | 1.1 | 1.0 | .9 | 1.0 | 1.2 | 1.3 | 1.2 | .9 | 1.0 | 1.1 | .9 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .8 | .8 | .9 | .9 |
| 1.1 | 1.0 | .9 | .9 | .8 | .9 | 1.2 | 1.4 | 1.3 | 1.1 | 1.1 | 1.0 | .8 | .9 | 1.0 | 1.1 | 1.3 | 1.1 | .9 | .8 | .8 | .9 | .9 | .9 | 1.1 | 1.0 | 1.0 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .9 | 1.0 |
| .9 | .8 | .8 | .9 | .9 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 1.1 | .8 | .9 | 1.0 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.0 | 1.0 | 1.1 | 1.2 | 1.1 | 1.1 | .9 | .9 |
| 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.0 | .9 | 1.0 |
| 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 | 1.1 |
| 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .9 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 |
| 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .9 | .9 | .9 | .8 | .8 | .7 | .7 | .8 | .8 | .8 | .8 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.0 |
| 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | .9 | .9 | .8 | .8 | .9 | .9 | .9 | .9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 |

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
FEBRUARY 2000 : AMSUA-9 channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 39



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .9 | .9 | .9 | .8 | .8 | .7 | .7 | .7 | .6 | .6 | .6 | .6 | .5 | .5 | .4 | .4 | .5 | .9 | .5 | .5 | .3 | .4 | .3 | .4 | .4 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .9 | .8 | .9 |
| .7 | .8 | .8 | .9 | .9 | .8 | .8 | .8 | .8 | .8 | .8 | .8 | .6 | .5 | .4 | .4 | .4 | .6 | .5 | .5 | .5 | .5 | .5 | .5 | .4 | .4 | .4 | .5 | .6 | .6 | .7 | .7 | .7 | .7 | .6 | .7 |
| .6 | .6 | .5 | .5 | .5 | .6 | .7 | .7 | .7 | .7 | .7 | .8 | .9 | .9 | 1.0 | 1.6 | .8 | .6 | .6 | .6 | .6 | .7 | .7 | .7 | .6 | .6 | .7 | .7 | .8 | .8 | .8 | .7 | .6 | .6 | .6 | .6 |
| .5 | .4 | .4 | .4 | .4 | .4 | .5 | .6 | .6 | .6 | .6 | .5 | .6 | .7 | .8 | .9 | .7 | .5 | .5 | .6 | .6 | .7 | .7 | .7 | .6 | .6 | .6 | .5 | .6 | .7 | .6 | .4 | .4 | .4 | .4 | .5 |
| .6 | .5 | .5 | .5 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .8 | 1.0 | .5 | .4 | .5 | .5 | .5 | .8 | .5 | .5 | .5 | .4 | .4 | .4 | .4 | .5 | .4 | .4 | .4 | .4 | .4 | .5 |
| .5 | .5 | .5 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .6 | .8 | .4 | .4 | .4 | .4 | .5 | .4 | .4 | .5 | .5 | .4 | .5 | .5 | .5 | .5 | .5 | | .5 | .4 | .4 | .5 |
| .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .4 | .4 | .5 | .4 | .4 | .4 | .4 | .5 | .4 | .4 | .8 | .5 | .5 | .5 | .5 | .5 | .5 | .5 | .4 | .4 | .4 | .4 | .4 |
| .4 | .4 | .4 | .4 | .4 | .4 | .5 | .4 | .3 | .4 | .4 | .4 | .3 | .4 | .4 | .5 | .4 | .3 | .4 | .3 | .5 | .4 | .4 | .4 | .4 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .4 |
| .4 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .6 | .4 | .3 | .4 | .4 | .4 | .3 | .4 | .4 | .5 | .4 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .4 | .4 |
| .4 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .5 | .4 | .4 | .3 | .4 | .4 | .3 | .4 | .4 | .4 | .4 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 |
| .4 | .4 | .3 | .3 | .4 | .4 | .4 | .3 | .3 | .4 | .4 | .3 | .4 | .4 | .4 | .4 | .3 | .4 | .3 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .3 | .3 | .4 | .4 | .4 | .4 | .4 |
| .4 | .5 | .4 | .3 | .3 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .3 | .3 | .4 | .4 | .3 | .3 | .4 | .4 | .4 | .4 | .4 | .3 | .4 | .3 | .3 | .4 | .3 | .3 | .4 | .3 |
| .4 | .5 | .4 | .4 | .4 | .3 | .4 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .3 | .4 | .6 | 1.0 | .9 | .4 | .3 | .4 | .4 | .3 | .4 | .3 |
| .5 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .6 | .8 | .7 | .4 | .4 | .4 | .4 | .5 | .5 | .6 | .5 | .4 | .4 | .4 | .4 | .5 | .5 | .5 | .8 | .9 | .4 | .4 | .4 | .4 | .4 | .4 | .4 |
| .4 | .4 | .4 | .4 | .5 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .5 | .5 | .5 | .6 | .5 | .4 | .4 | .4 | .5 | .6 | .6 | .5 | .5 | .4 | .4 | .4 | .4 | .5 | .4 | .5 | .5 |
| .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .3 | .3 | .3 | .5 | .4 | .4 | .4 | .3 | .3 | .3 | .3 | .4 | .4 | .4 | .4 | .4 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 |
| .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .4 | .5 | .6 | .6 | .5 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 |
| .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .2 | .2 |

# TABLE 8

## MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
## DATA TYPE:- DRIFTER
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for drifting buoy.

**Area monitored** :10°N - 80°N, 85°W - 0°W

**Standard of comparison** :Background field from UKMO global model.

**Position** :Average latitude and longitude for period.

**Observation times** :All hours combined.

**Elements monitored**
:Mean sea-level pressure (hPa)
:Wind speed (m $s^{-1}$)
:Wind direction (degrees)

**Parameters monitored**

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
**N.B. A positive bias indicates the observation is veered to the background**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

**GROSS ERROR LIMITS**
:15 hPa (pressure)
:25 m $s^{-1}$ (Vector Wind)

**N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m $s^{-1}$**

| IDENTIFIER | LAT. | LONG. | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | | | |
| 03573 | 32.0 | -16.0 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | -3.3 | 3.3 |
| 21517 | 37.1 | -8.5 | ALL | P | SUR | 1 | 1 | 100 | | | |
| 25565 | 42.3 | -83.7 | ALL | P | SUR | 26 | 26 | 100 | | | |
| 41520 | 24.8 | -54.0 | ALL | P | SUR | 260 | 0 | 0 | 1.0 | -0.6 | 1.2 |
| 41521 | 28.0 | -66.6 | ALL | P | SUR | 278 | 0 | 0 | 0.8 | -0.2 | 0.8 |
| 41524 | 18.2 | -72.1 | ALL | P | SUR | 192 | 0 | 0 | 0.9 | 0.1 | 0.9 |
| 41528 | 33.9 | -54.2 | ALL | P | SUR | 205 | 0 | 0 | 1.0 | 0.0 | 1.0 |
| 41599 | 27.5 | -40.5 | ALL | P | SUR | 140 | 2 | 1 | 0.9 | -2.0 | 2.2 |
| 41625 | 25.4 | -70.7 | ALL | P | SUR | 257 | 0 | 0 | 0.9 | 0.0 | 0.9 |
| 41630 | 19.8 | -53.4 | ALL | P | SUR | 246 | 0 | 0 | 0.9 | -0.1 | 0.9 |
| 41641 | 20.6 | -59.5 | ALL | P | SUR | 158 | 0 | 0 | 0.7 | 0.6 | 1.0 |
| 41644 | 25.3 | -48.2 | ALL | P | SUR | 256 | 0 | 0 | 1.0 | -0.3 | 1.1 |
| 41651 | 30.9 | -75.2 | ALL | P | SUR | 280 | 0 | 0 | 1.0 | 0.5 | 1.1 |
| 41671 | 26.2 | -74.6 | ALL | P | SUR | 281 | 0 | 0 | 0.9 | 0.3 | 0.9 |
| 41853 | 33.6 | -69.2 | ALL | P | SUR | 244 | 0 | 0 | 1.8 | 2.9 | 3.4 |
| 44546 | 39.3 | -25.6 | ALL | P | SUR | 1055 | 0 | 0 | 0.9 | 0.6 | 1.1 |
| 44607 | 51.5 | -33.9 | ALL | P | SUR | 539 | 21 | 4 | 4.8 | -0.9 | 4.9 |
| 44608 | 38.6 | -15.8 | ALL | P | SUR | 1350 | 0 | 0 | 0.8 | 0.3 | 0.9 |
| 44610 | 56.4 | -33.2 | ALL | P | SUR | 1374 | 14 | 1 | 3.1 | 0.2 | 3.1 |
| 44613 | 26.6 | -36.8 | ALL | P | SUR | 732 | 9 | 1 | 1.0 | -0.4 | 1.1 |
| 44614 | 51.2 | -10.9 | ALL | P | SUR | 1005 | 5 | 0 | 1.6 | 0.0 | 1.6 |
| 44621 | 50.5 | -7.5 | ALL | P | SUR | 1102 | 18 | 2 | 1.5 | 0.0 | 1.5 |
| 44625 | 49.9 | -6.5 | ALL | P | SUR | 460 | 1 | 0 | 1.7 | 0.2 | 1.7 |
| 44626 | 48.2 | -28.8 | ALL | P | SUR | 1234 | 7 | 1 | 1.9 | 0.2 | 2.0 |
| 44627 | 46.6 | -35.4 | ALL | P | SUR | 1184 | 7 | 1 | 1.9 | 0.2 | 1.9 |
| 44628 | 39.8 | -47.2 | ALL | P | SUR | 975 | 7 | 1 | 1.8 | 0.4 | 1.8 |
| 44630 | 47.4 | -24.0 | ALL | P | SUR | 1182 | 8 | 1 | 1.4 | 0.2 | 1.4 |
| 44655 | 47.5 | -57.4 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | 1.4 | 1.4 |
| 44657 | 47.7 | -61.3 | ALL | P | SUR | 154 | 146 | 95 | 9.4 | -3.1 | 9.9 |
| 44721 | 58.9 | -13.2 | ALL | P | SUR | 1726 | 9 | 1 | 2.4 | -0.8 | 2.5 |
| 44722 | 57.7 | -17.1 | ALL | P | SUR | 1768 | 9 | 1 | 2.5 | -0.8 | 2.6 |
| 44723 | 46.0 | -39.1 | ALL | P | SUR | 501 | 3 | 1 | 2.3 | 0.6 | 2.4 |
| 44744 | 43.8 | -60.7 | ALL | P | SUR | 3 | 0 | 0 | 2.0 | -0.1 | 2.0 |
| 44765 | 31.7 | -55.4 | ALL | P | SUR | 455 | 3 | 1 | 1.1 | -0.6 | 1.3 |
| 44766 | 54.9 | -8.3 | ALL | P | SUR | 237 | 1 | 0 | 1.9 | -7.3 | 7.5 |
| 44773 | 57.4 | -28.4 | ALL | P | SUR | 421 | 59 | 14 | 4.7 | -2.1 | 5.1 |
| 44777 | 58.5 | -26.6 | ALL | P | SUR | 1721 | 11 | 1 | 2.3 | -0.9 | 2.5 |
| 44808 | 40.5 | -69.4 | ALL | P | SUR | 2 | 0 | 0 | 0.4 | -0.7 | 0.8 |
| 44825 | 40.3 | -73.2 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | -2.9 | 2.9 |
| 44840 | 43.8 | -51.5 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | 0.2 | 0.2 |
| 46632 | 44.8 | -63.5 | ALL | P | SUR | 11 | 0 | 0 | 2.4 | -6.4 | 6.8 |
| 57772 | 51.6 | -23.5 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | -1.1 | 1.1 |
| 62507 | 40.8 | -25.2 | ALL | P | SUR | 1074 | 3 | 0 | 1.0 | 0.2 | 1.0 |
| 62508 | 43.6 | -15.5 | ALL | P | SUR | 985 | 8 | 1 | 1.5 | -0.2 | 1.5 |
| 62509 | 46.0 | -8.6 | ALL | P | SUR | 933 | 2 | 0 | 1.3 | 0.5 | 1.4 |
| 62520 | 31.2 | -33.1 | ALL | P | SUR | 839 | 3 | 0 | 1.1 | -0.5 | 1.2 |
| 62554 | 34.1 | -14.0 | ALL | P | SUR | 16 | 16 | 100 | | | |
| 62596 | 55.3 | -26.5 | ALL | P | SUR | 494 | 5 | 1 | 3.3 | 1.1 | 3.5 |
| 62597 | 54.9 | -22.8 | ALL | P | SUR | 763 | 4 | 1 | 2.4 | -0.5 | 2.5 |
| 62787 | 50.1 | -6.1 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | 0.2 | 0.2 |
| 62801 | 47.9 | -3.9 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | 0.8 | 0.8 |
| 63581 | 51.0 | -13.3 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | -0.3 | 0.3 |
| 64517 | 58.0 | -33.3 | ALL | P | SUR | 1033 | 0 | 0 | 2.5 | -0.9 | 2.7 |
| 64518 | 57.8 | -9.8 | ALL | P | SUR | 1051 | 1 | 0 | 2.2 | -0.7 | 2.3 |
| 64530 | 62.8 | -11.2 | ALL | P | SUR | 1264 | 15 | 1 | 2.1 | -1.1 | 2.4 |
| 64546 | 64.1 | -21.9 | ALL | P | SUR | 350 | 5 | 1 | 2.5 | -6.6 | 7.1 |
| 64547 | 63.2 | -9.9 | ALL | P | SUR | 1277 | 9 | 1 | 2.3 | -1.1 | 2.5 |
| 64698 | 60.0 | -50.7 | ALL | P | SUR | 877 | 42 | 5 | 3.8 | -1.4 | 4.0 |
| 64699 | 63.2 | -56.7 | ALL | P | SUR | 853 | 26 | 3 | 3.0 | 0.2 | 3.1 |
| 65594 | 62.5 | -39.6 | ALL | P | SUR | 324 | 223 | 69 | 4.3 | 8.9 | 9.9 |

| IDENTIFIER | LAT. | LONG. | HOUR | ELEM | LEVEL | NOBS | NGE | PGE | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | | | |
| 65595 | 61.8 | -4.6 | ALL | P | SUR | 1627 | 9 | 1 | 2.0 | -1.2 | 2.3 |
| 65596 | 62.1 | -33.3 | ALL | P | SUR | 968 | 2 | 0 | 2.1 | -0.9 | 2.3 |
| 65598 | 63.9 | -26.6 | ALL | P | SUR | 1235 | 14 | 1 | 2.7 | -1.2 | 2.9 |
| 65599 | 64.4 | -29.2 | ALL | P | SUR | 1999 | 9 | 0 | 2.4 | -0.3 | 2.4 |
| 65600 | 63.5 | -20.4 | ALL | P | SUR | 379 | 0 | 0 | 2.1 | -0.3 | 2.2 |
| 956945 | 45.3 | -7.8 | ALL | P | SUR | 1 | 0 | 0 | 0.0 | -1.1 | 1.1 |
| WIND SPEED | | | | | | | | | | | |
| 03573 | 32.0 | -16.0 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | 1.2 | 1.2 |
| 41520 | 24.8 | -54.0 | ALL | SPEED | SUR | 10 | 0 | 0 | 1.8 | 2.3 | 2.9 |
| 41521 | 28.0 | -66.6 | ALL | SPEED | SUR | 266 | 0 | 0 | 1.4 | 0.1 | 1.4 |
| 41625 | 25.4 | -70.7 | ALL | SPEED | SUR | 229 | 0 | 0 | 1.7 | -1.2 | 2.1 |
| 41630 | 19.8 | -53.4 | ALL | SPEED | SUR | 241 | 0 | 0 | 2.2 | 0.7 | 2.3 |
| 41641 | 20.6 | -59.5 | ALL | SPEED | SUR | 153 | 0 | 0 | 2.4 | 0.6 | 2.5 |
| 41644 | 25.3 | -48.2 | ALL | SPEED | SUR | 3 | 0 | 0 | 1.7 | -6.3 | 6.6 |
| 41651 | 30.9 | -75.2 | ALL | SPEED | SUR | 24 | 0 | 0 | 5.5 | 4.9 | 7.4 |
| 44607 | 51.5 | -33.9 | ALL | SPEED | SUR | 523 | 0 | 0 | 4.1 | 1.3 | 4.3 |
| 44657 | 47.7 | -61.3 | ALL | SPEED | SUR | 19 | 0 | 0 | 12.2 | 10.4 | 16.0 |
| 44721 | 58.9 | -13.2 | ALL | SPEED | SUR | 1329 | 0 | 0 | 3.5 | -1.7 | 3.9 |
| 44744 | 43.8 | -60.7 | ALL | SPEED | SUR | 3 | 0 | 0 | 1.6 | 0.2 | 1.6 |
| 44773 | 57.4 | -28.4 | ALL | SPEED | SUR | 139 | 0 | 0 | 2.1 | -4.6 | 5.1 |
| 44777 | 58.5 | -26.6 | ALL | SPEED | SUR | 1299 | 0 | 0 | 3.1 | -2.6 | 4.0 |
| 44808 | 40.5 | -69.4 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | 1.0 | 1.0 |
| 44825 | 40.3 | -73.2 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | 1.7 | 1.7 |
| 44840 | 43.8 | -51.5 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -1.1 | 1.1 |
| 57772 | 51.6 | -23.5 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -4.2 | 4.2 |
| 62506 | 36.7 | -22.7 | ALL | SPEED | SUR | 517 | 0 | 0 | 1.9 | 0.8 | 2.0 |
| 62508 | 43.6 | -15.5 | ALL | SPEED | SUR | 783 | 0 | 0 | 1.8 | -0.4 | 1.9 |
| 62510 | 49.7 | -2.3 | ALL | SPEED | SUR | 507 | 0 | 0 | 2.2 | 1.4 | 2.6 |
| 62597 | 54.9 | -22.8 | ALL | SPEED | SUR | 726 | 0 | 0 | 2.6 | -1.9 | 3.2 |
| 62605 | 55.5 | -12.9 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -0.1 | 0.1 |
| 62706 | 57.8 | -7.1 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -1.0 | 1.0 |
| 62787 | 50.1 | -6.1 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -1.0 | 1.0 |
| 62801 | 47.9 | -3.9 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -1.9 | 1.9 |
| 63581 | 51.0 | -13.3 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | -1.3 | 1.3 |
| 956945 | 45.3 | -7.8 | ALL | SPEED | SUR | 1 | 0 | 0 | 0.0 | 3.2 | 3.2 |
| WIND DIRECTION | | | | | | | | | | | |
| 03573 | 32.0 | -16.0 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -8.3 | 8.3 |
| 41520 | 24.8 | -54.0 | ALL | DIRN. | SUR | 10 | 0 | 0 | 10.0 | -23.4 | 25.4 |
| 41521 | 28.0 | -66.6 | ALL | DIRN. | SUR | 182 | 0 | 0 | 18.9 | -2.3 | 19.0 |
| 41625 | 25.4 | -70.7 | ALL | DIRN. | SUR | 109 | 0 | 0 | 15.9 | 5.8 | 16.9 |
| 41630 | 19.8 | -53.4 | ALL | DIRN. | SUR | 205 | 0 | 0 | 14.7 | 19.7 | 24.6 |
| 41641 | 20.6 | -59.5 | ALL | DIRN. | SUR | 123 | 0 | 0 | 18.4 | 26.4 | 32.2 |
| 41651 | 30.9 | -75.2 | ALL | DIRN. | SUR | 19 | 0 | 0 | 20.2 | -2.7 | 20.4 |
| 44607 | 51.5 | -33.9 | ALL | DIRN. | SUR | 487 | 0 | 0 | 24.3 | 2.7 | 24.5 |
| 44657 | 47.7 | -61.3 | ALL | DIRN. | SUR | 8 | 0 | 0 | 21.9 | 54.0 | 58.3 |
| 44721 | 58.9 | -13.2 | ALL | DIRN. | SUR | 1157 | 0 | 0 | 23.0 | 10.1 | 25.1 |
| 44744 | 43.8 | -60.7 | ALL | DIRN. | SUR | 2 | 0 | 0 | 13.4 | -31.1 | 33.8 |
| 44773 | 57.4 | -28.4 | ALL | DIRN. | SUR | 36 | 0 | 0 | 38.9 | 3.0 | 39.1 |
| 44777 | 58.5 | -26.6 | ALL | DIRN. | SUR | 1182 | 0 | 0 | 20.7 | 10.1 | 23.0 |
| 44825 | 40.3 | -73.2 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -12.7 | 12.7 |
| 44840 | 43.8 | -51.5 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -37.7 | 37.7 |
| 57772 | 51.6 | -23.5 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -8.0 | 8.0 |
| 62506 | 36.7 | -22.7 | ALL | DIRN. | SUR | 348 | 0 | 0 | 24.0 | -8.3 | 25.4 |
| 62508 | 43.6 | -15.5 | ALL | DIRN. | SUR | 647 | 0 | 0 | 21.6 | -6.5 | 22.6 |
| 62510 | 49.7 | -2.3 | ALL | DIRN. | SUR | 459 | 0 | 0 | 21.2 | -7.7 | 22.6 |
| 62597 | 54.9 | -22.8 | ALL | DIRN. | SUR | 668 | 0 | 0 | 31.9 | 4.2 | 32.2 |
| 62605 | 55.5 | -12.9 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | 12.4 | 12.4 |
| 62706 | 57.8 | -7.1 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -15.6 | 15.6 |
| 62787 | 50.1 | -6.1 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | 14.4 | 14.4 |
| 62801 | 47.9 | -3.9 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | 3.8 | 3.8 |
| 63581 | 51.0 | -13.3 | ALL | DIRN. | SUR | 1 | 0 | 0 | 0.0 | -3.1 | 3.1 |

# TABLE 9

## MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures:**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Statistics for each airline carrier. |
| **Area monitored** | | :40°N - 70°N, 60°W - 0°W. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :All hours combined. |
| **Level(s) monitored** | | :300.0 - 150.0 hPa |
| **Elements monitored** | | :TEMP in °C ; WIND in $m\ s^{-1}$ |
| **Parameters monitored** | :N REP. | :Number of observations received excluding duplicates. |
| | :PG | :Percentage of observations with gross errors. |
| | :PR | :Percentage of observations rejected by quality control including rejections from the duplicate check. |
| | :PC | :Percentage of observations with calm winds. |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind. |
| **GROSS ERROR LIMITS** | :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind | |
| **SELECTION CRITERIA** | :N REP ≥ 20 | |

**NB:** All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

|  |  | TEMPERATURE |  |  |  | WIND |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAL | 2664 | 0 | 5 | 1.7 | 0.0 | 2651 | 0 | 5 | 0 | 8.6 | 1.0 |
| ACA | 1137 | 0 | 4 | 2.3 | 0.4 | 1156 | 0 | 3 | 0 | 7.8 | 0.5 |
| AEA | 144 | 1 | 5 | 2.0 | 0.4 | 142 | 0 | 6 | 0 | 8.5 | 0.4 |
| AEL | 321 | 1 | 17 | 1.9 | -1.0 | 323 | 0 | 17 | 0 | 9.4 | 0.9 |
| AEY | 69 | 3 | 7 | 1.9 | 1.1 | 70 | 1 | 6 | 0 | 8.6 | 1.8 |
| AFL | 422 | 0 | 4 | 1.9 | 0.2 | 422 | 0 | 5 | 0 | 9.0 | 0.1 |
| AFR | 1204 | 1 | 8 | 1.8 | -0.2 | 1222 | 0 | 9 | 0 | 9.0 | 1.1 |
| AIH | 154 | 2 | 4 | 1.8 | 0.1 | 158 | 1 | 4 | 0 | 9.9 | 1.1 |
| AJM | 67 | 0 | 1 | 2.0 | -0.6 | 69 | 0 | 1 | 0 | 10.8 | 0.7 |
| AMM | 94 | 0 | 10 | 1.7 | 0.3 | 95 | 0 | 11 | 0 | 9.2 | 2.5 |
| AMX | 180 | 2 | 5 | 2.4 | 0.1 | 179 | 1 | 4 | 0 | 9.2 | 1.4 |
| ANZ | 152 | 2 | 16 | 2.0 | -1.0 | 153 | 0 | 16 | 0 | 8.9 | 0.3 |
| AOM | 406 | 0 | 5 | 1.6 | 0.5 | 415 | 0 | 7 | 0 | 9.1 | 1.5 |
| AUA | 38 | 0 | 0 | 1.5 | -0.1 | 37 | 0 | 0 | 0 | 6.7 | 0.7 |
| AVA | 169 | 0 | 1 | 2.0 | 0.3 | 175 | 1 | 5 | 0 | 10.4 | 2.1 |
| AZA | 368 | 2 | 6 | 2.0 | 0.6 | 373 | 1 | 7 | 0 | 9.5 | 0.8 |
| BAL | 171 | 0 | 15 | 1.8 | 0.3 | 176 | 0 | 16 | 0 | 9.0 | 1.0 |
| BAW | 1262 | 1 | 7 | 2.0 | -0.1 | 1286 | 0 | 7 | 0 | 7.7 | 0.9 |
| BLX | 26 | 8 | 12 | 2.0 | -0.5 | 24 | 0 | 4 | 0 | 10.8 | 5.5 |
| BWA | 67 | 1 | 12 | 2.1 | 1.2 | 67 | 0 | 16 | 0 | 13.1 | 0.5 |
| CDN | 569 | 0 | 4 | 1.8 | 0.2 | 577 | 0 | 5 | 0 | 7.9 | 0.9 |
| CFC | 41 | 0 | 10 | 2.1 | 0.6 | 44 | 0 | 20 | 0 | 13.1 | 1.0 |
| CFG | 613 | 1 | 4 | 2.0 | -0.9 | 624 | 1 | 5 | 0 | 9.9 | 0.6 |
| CKS | 20 | 0 | 0 | 2.2 | 0.3 | 21 | 0 | 10 | 0 | 15.9 | -1.9 |
| CKT | 73 | 1 | 5 | 1.7 | 1.1 | 71 | 0 | 7 | 0 | 9.2 | -0.7 |
| CLX | 242 | 0 | 3 | 2.1 | -0.3 | 243 | 0 | 4 | 0 | 8.5 | 0.3 |
| CMM | 96 | 0 | 2 | 2.1 | -0.3 | 97 | 0 | 4 | 0 | 8.1 | 1.1 |
| COA | 661 | 0 | 3 | 1.9 | -0.3 | 666 | 1 | 10 | 0 | 13.2 | 2.4 |
| CRL | 350 | 2 | 5 | 1.6 | 0.5 | 360 | 0 | 5 | 0 | 8.1 | 1.2 |
| CTB | 87 | 0 | 6 | 1.7 | -0.2 | 89 | 0 | 7 | 0 | 10.9 | 1.7 |
| CUB | 127 | 0 | 3 | 2.0 | 1.0 | 126 | 0 | 6 | 0 | 9.0 | 0.6 |
| DAL | 1440 | 0 | 13 | 1.8 | -0.5 | 1459 | 0 | 13 | 0 | 8.9 | 0.9 |
| DBY | 233 | 0 | 2 | 1.6 | -0.4 | 237 | 0 | 3 | 0 | 9.4 | 1.3 |
| DCS | 25 | 0 | 0 | 1.2 | -0.2 | 25 | 0 | 4 | 0 | 11.4 | 0.4 |
| DLH | 1804 | 0 | 7 | 2.0 | 0.0 | 1805 | 0 | 6 | 0 | 7.7 | 1.0 |
| EEZ | 121 | 2 | 100 | 3.8 | 2.1 | 120 | 0 | 17 | 0 | 10.8 | 1.1 |
| EIN | 57 | 0 | 7 | 1.7 | -0.1 | 59 | 0 | 7 | 0 | 7.2 | 1.6 |
| ELY | 95 | 0 | 3 | 1.6 | 0.2 | 104 | 1 | 7 | 0 | 8.3 | 0.4 |
| EWW | 94 | 0 | 10 | 2.4 | 0.5 | 96 | 0 | 11 | 0 | 9.9 | 1.2 |
| FDX | 561 | 0 | 8 | 1.9 | 0.3 | 582 | 0 | 9 | 0 | 10.3 | 1.1 |
| FIN | 358 | 0 | 3 | 1.8 | 0.2 | 359 | 0 | 4 | 0 | 8.0 | 0.4 |
| GAF | 23 | 0 | 17 | 2.6 | -1.0 | 23 | 0 | 26 | 0 | 16.4 | -3.4 |
| GCO | 51 | 0 | 8 | 1.7 | 0.5 | 53 | 0 | 13 | 0 | 14.9 | 2.2 |
| GRL | 54 | 0 | 4 | 1.7 | 0.2 | 57 | 0 | 7 | 0 | 6.7 | 0.7 |
| GTI | 155 | 1 | 8 | 2.0 | -0.5 | 155 | 0 | 9 | 0 | 9.4 | 0.9 |
| HLF | 48 | 2 | 2 | 1.2 | -0.2 | 50 | 0 | 2 | 0 | 10.4 | 2.3 |
| IBE | 1253 | 0 | 11 | 1.9 | 0.6 | 1263 | 0 | 13 | 0 | 10.4 | 1.4 |
| ICE | 1139 | 0 | 2 | 1.6 | -0.2 | 1126 | 0 | 3 | 0 | 7.5 | 0.8 |
| IWD | 50 | 0 | 8 | 1.8 | 0.1 | 51 | 2 | 6 | 0 | 6.9 | -0.2 |
| JKK | 176 | 1 | 7 | 1.5 | -0.2 | 165 | 0 | 7 | 0 | 8.7 | 0.6 |
| KLM | 1698 | 0 | 7 | 1.8 | 0.2 | 1732 | 0 | 8 | 0 | 8.2 | 0.6 |
| LDA | 56 | 0 | 14 | 1.3 | -0.2 | 55 | 0 | 15 | 0 | 10.1 | 0.8 |
| LDI | 445 | 0 | 100 | 2.8 | 0.3 | 456 | 0 | 13 | 0 | 8.4 | 0.3 |
| LIB | 176 | 1 | 6 | 2.0 | 1.2 | 180 | 0 | 8 | 0 | 10.6 | 1.8 |
| LOT | 102 | 0 | 7 | 1.9 | -1.0 | 99 | 0 | 9 | 0 | 8.4 | -0.9 |
| LTU | 334 | 0 | 3 | 1.9 | -0.2 | 335 | 1 | 5 | 0 | 8.9 | 1.6 |
| MAS | 48 | 0 | 4 | 2.0 | 0.4 | 49 | 2 | 10 | 0 | 13.0 | 2.1 |
| MON | 97 | 2 | 3 | 1.6 | -0.3 | 101 | 0 | 4 | 0 | 7.9 | 0.6 |
| MPD | 117 | 2 | 14 | 2.4 | 0.2 | 115 | 0 | 10 | 0 | 8.4 | 1.8 |

| | | TEMPERATURE | | | | | | WIND | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| MPH | 491 | 1 | 3 | 2.0 | -0.6 | 498 | 0 | 4 | 0 | 8.4 | 0.5 |
| NCA | 35 | 0 | 3 | 2.0 | 0.6 | 34 | 0 | 3 | 0 | 9.3 | 1.1 |
| NVR | 30 | 0 | 0 | 2.0 | 0.2 | 30 | 0 | 0 | 0 | 4.6 | 0.0 |
| NWA | 2509 | 0 | 2 | 1.9 | 0.6 | 2484 | 0 | 2 | 0 | 9.0 | 0.7 |
| PAC | 102 | 0 | 7 | 2.5 | 0.4 | 104 | 0 | 12 | 0 | 13.0 | 2.0 |
| RAM | 50 | 0 | 4 | 1.9 | -0.9 | 50 | 0 | 12 | 0 | 14.6 | -0.8 |
| RCH | 63 | 3 | 8 | 1.7 | 0.1 | 65 | 0 | 48 | 0 | 14.3 | 1.1 |
| RJA | 33 | 0 | 3 | 2.2 | 0.2 | 32 | 0 | 6 | 0 | 11.9 | -1.6 |
| RRR | 99 | 3 | 12 | 1.8 | 0.0 | 103 | 2 | 12 | 0 | 9.4 | 1.8 |
| RZO | 24 | 4 | 4 | 1.3 | -0.7 | 23 | 0 | 0 | 0 | 9.0 | 3.1 |
| SAB | 24 | 0 | 4 | 2.0 | 0.4 | 24 | 0 | 8 | 0 | 10.5 | 2.5 |
| SAS | 1363 | 0 | 33 | 2.0 | -0.1 | 1361 | 0 | 33 | 0 | 7.4 | 0.4 |
| SIA | 135 | 0 | 4 | 2.0 | -1.2 | 140 | 0 | 6 | 0 | 6.4 | 0.3 |
| SLR | 111 | 0 | 15 | 2.0 | -1.0 | 111 | 0 | 14 | 0 | 7.7 | 1.7 |
| SNB | 86 | 0 | 5 | 1.7 | 0.6 | 87 | 0 | 5 | 0 | 8.2 | 1.1 |
| SVA | 79 | 3 | 6 | 1.6 | 0.2 | 90 | 0 | 6 | 0 | 10.8 | 0.5 |
| SWR | 99 | 1 | 6 | 1.7 | 0.5 | 99 | 0 | 5 | 0 | 8.7 | 1.9 |
| TAP | 249 | 1 | 7 | 1.9 | -0.3 | 247 | 0 | 6 | 0 | 10.1 | 1.0 |
| TOW | 95 | 1 | 3 | 1.6 | 0.3 | 95 | 0 | 3 | 0 | 9.1 | 2.8 |
| TPA | 30 | 3 | 20 | 1.0 | 0.3 | 31 | 0 | 19 | 0 | 7.8 | 0.3 |
| TSC | 41 | 2 | 2 | 1.9 | 1.3 | 42 | 0 | 7 | 0 | 11.3 | 3.2 |
| TWA | 757 | 1 | 6 | 2.0 | -0.2 | 696 | 0 | 6 | 0 | 9.4 | 1.1 |
| UAL | 1748 | 0 | 5 | 1.8 | -0.2 | 1778 | 0 | 5 | 0 | 7.6 | 1.0 |
| UPS | 645 | 0 | 13 | 2.4 | 0.8 | 656 | 0 | 13 | 0 | 8.7 | 0.7 |
| USA | 343 | 2 | 4 | 1.8 | -0.1 | 285 | 0 | 4 | 0 | 8.7 | 1.8 |
| VIR | 609 | 1 | 3 | 1.8 | -0.3 | 614 | 0 | 3 | 0 | 8.4 | 1.0 |
| VKG | 127 | 0 | 2 | 1.9 | -0.4 | 130 | 0 | 4 | 0 | 9.4 | 1.5 |
| WOA | 99 | 2 | 10 | 1.8 | 0.1 | 103 | 0 | 11 | 0 | 9.1 | 0.1 |
| BA | 1312 | 2 | 13 | 2.0 | 0.5 | 1303 | 2 | 18 | 0 | 13.4 | -0.8 |
| EU | 11038 | 0 | 17 | 1.8 | 0.0 | 11038 | 0 | 15 | 0 | 6.5 | 0.5 |
| KL | 3385 | 1 | 12 | 2.0 | 0.8 | 3379 | 1 | 12 | 0 | 9.7 | 0.6 |
| N | 309 | 1 | 4 | 2.3 | 0.5 | 316 | 0 | 6 | 0 | 10.8 | 0.1 |
| US ACARS | 12727 | 0 | 20 | 1.7 | 0.6 | 12727 | 0 | 18 | 0 | 7.4 | 0.8 |

# TABLE 10

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from selected radiosonde TEMPs. |
| **Area monitored** | | :0°N - 90°N, 100°W - 40°E |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 12 UTC. |
| **Level monitored** | | :100 hPa. |
| **Element monitored** | | :GEOPOTENTIAL HEIGHT in metres |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :SD | :SD of difference of observations from background values at level shown excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values at level shown excluding those with gross errors. |

**GROSS ERROR LIMITS** :Defined in Appendix I.1

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | SD | RMS | BIAS |
|---|---|---|---|---|---|---|---|---|
| ELML7 | 00 | Z | 100 | 9 | 0 | 10.1 | 34.3 | 32.8 |
| ELML7 | 12 | Z | 100 | 9 | 0 | 12.1 | 42.5 | 40.8 |
| FNOR | 00 | Z | 100 | 9 | 0 | 15.8 | 43.4 | 40.4 |
| FNOR | 12 | Z | 100 | 12 | 0 | 10.0 | 25.9 | 23.9 |
| FNOU | 00 | Z | 100 | 11 | 0 | 7.4 | 26.9 | 25.9 |
| FNOU | 12 | Z | 100 | 9 | 0 | 6.1 | 20.2 | 19.2 |
| FNPH | 00 | Z | 100 | 9 | 0 | 14.7 | 27.8 | 23.6 |
| FNPH | 12 | Z | 100 | 10 | 0 | 10.3 | 22.3 | 19.8 |
| FNRS | 00 | Z | 100 | 10 | 0 | 9.8 | 32.5 | 31.0 |
| FNRS | 12 | Z | 100 | 10 | 0 | 17.5 | 30.5 | 24.9 |
| LDWR | 00 | Z | 100 | 25 | 0 | 14.4 | 14.8 | -3.1 |
| LDWR | 12 | Z | 100 | 25 | 0 | 14.1 | 14.8 | -4.6 |
| OVYA2 | 00 | Z | 100 | 14 | 0 | 26.6 | 26.6 | -0.8 |
| OVYA2 | 12 | Z | 100 | 14 | 0 | 27.0 | 27.0 | -1.2 |
| OXTS2 | 00 | Z | 100 | 14 | 0 | 15.5 | 17.5 | -8.1 |
| OXTS2 | 12 | Z | 100 | 13 | 0 | 25.4 | 27.5 | -10.4 |
| ZCBP6 | 00 | Z | 100 | 5 | 0 | 55.6 | 68.8 | 40.4 |
| ZCBP6 | 12 | Z | 100 | 4 | 0 | 21.9 | 23.5 | -8.5 |
| 03953 | 00 | Z | 100 | 27 | 0 | 17.0 | 31.2 | 26.1 |
| 03953 | 12 | Z | 100 | 29 | 0 | 24.5 | 34.4 | 24.2 |
| 04018 | 00 | Z | 100 | 25 | 0 | 36.9 | 38.9 | 12.4 |
| 04018 | 12 | Z | 100 | 28 | 0 | 16.7 | 17.9 | 6.4 |
| 04220 | 00 | Z | 100 | 24 | 0 | 24.0 | 26.1 | 10.3 |
| 04220 | 12 | Z | 100 | 29 | 0 | 22.8 | 23.2 | -4.4 |
| 04270 | 00 | Z | 100 | 24 | 0 | 26.6 | 30.1 | -14.2 |
| 04270 | 12 | Z | 100 | 26 | 0 | 21.1 | 27.5 | -17.6 |
| 04339 | 00 | Z | 100 | 27 | 0 | 14.2 | 17.6 | 10.4 |
| 04339 | 12 | Z | 100 | 27 | 0 | 13.3 | 14.7 | 6.4 |
| 04360 | 00 | Z | 100 | 28 | 0 | 53.7 | 54.5 | -9.0 |
| 04360 | 12 | Z | 100 | 29 | 0 | 17.5 | 19.3 | -8.2 |
| 08001 | 00 | Z | 100 | 26 | 0 | 22.3 | 22.9 | 4.8 |
| 08001 | 12 | Z | 100 | 27 | 1 | 24.2 | 26.7 | -11.3 |
| 08508 | 00 | Z | 100 | 26 | 0 | 10.7 | 25.1 | 22.7 |
| 08508 | 12 | Z | 100 | 29 | 0 | 20.3 | 36.8 | 30.7 |
| 08522 | 12 | Z | 100 | 28 | 0 | 12.9 | 18.5 | 13.3 |
| 08594 | 12 | Z | 100 | 22 | 0 | 19.3 | 39.2 | 34.1 |
| 60020 | 00 | Z | 100 | 1 | 0 | 0.0 | 26.0 | 26.0 |
| 71600 | 00 | Z | 100 | 28 | 0 | 15.2 | 26.7 | 22.0 |
| 71600 | 12 | Z | 100 | 28 | 0 | 13.8 | 16.3 | 8.5 |
| 72201 | 00 | Z | 100 | 27 | 0 | 20.8 | 29.2 | 20.5 |
| 72201 | 12 | Z | 100 | 28 | 0 | 19.9 | 30.1 | 22.6 |
| 72402 | 00 | Z | 100 | 28 | 0 | 14.4 | 31.8 | 28.4 |
| 72402 | 12 | Z | 100 | 28 | 0 | 14.0 | 26.2 | 22.1 |
| 74494 | 00 | Z | 100 | 18 | 0 | 17.3 | 24.3 | 17.1 |
| 74494 | 12 | Z | 100 | 25 | 0 | 16.7 | 22.5 | -15.0 |
| 78016 | 12 | Z | 100 | 26 | 0 | 18.7 | 35.4 | 30.0 |

# TABLE 11

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures:**

**Period** :One calendar month.

**Data monitored** :Reports from selected radiosonde TEMPs.

**Area monitored** :0°N - 90°N, 100°W - 40°E

**Standard of comparison** :Background field from UKMO global model.

**Position** :Average latitude and longitude for period.

**Observation times** :00, 12 UTC.

**Level monitored** :500 hPa.

**Element monitored** :GEOPOTENTIAL HEIGHT in metres

**Parameters monitored** :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

**GROSS ERROR LIMITS** :Defined in Appendix I.1

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | SD | RMS | BIAS |
|---|---|---|---|---|---|---|---|---|
| ELML7 | 00 | Z | 500 | 19 | 0 | 7.8 | 19.9 | 18.3 |
| ELML7 | 12 | Z | 500 | 18 | 0 | 7.4 | 20.1 | 18.7 |
| FNOR | 00 | Z | 500 | 9 | 0 | 15.1 | 22.0 | 16.0 |
| FNOR | 12 | Z | 500 | 12 | 0 | 10.8 | 20.3 | 17.3 |
| FNOU | 00 | Z | 500 | 13 | 0 | 5.3 | 10.1 | 8.5 |
| FNOU | 12 | Z | 500 | 11 | 0 | 6.1 | 11.9 | 10.2 |
| FNPH | 00 | Z | 500 | 10 | 0 | 5.2 | 9.6 | 8.1 |
| FNPH | 12 | Z | 500 | 10 | 0 | 9.0 | 12.9 | 9.2 |
| FNRS | 00 | Z | 500 | 13 | 0 | 7.5 | 14.0 | 11.8 |
| FNRS | 12 | Z | 500 | 11 | 0 | 9.1 | 16.1 | 13.3 |
| LDWR | 00 | Z | 500 | 27 | 0 | 14.0 | 14.7 | 4.4 |
| LDWR | 12 | Z | 500 | 25 | 0 | 10.9 | 11.6 | -3.9 |
| OVYA2 | 00 | Z | 500 | 16 | 1 | 20.7 | 21.2 | 4.7 |
| OVYA2 | 12 | Z | 500 | 17 | 0 | 21.5 | 21.6 | -1.1 |
| OXTS2 | 00 | Z | 500 | 17 | 0 | 21.9 | 22.5 | -5.1 |
| OXTS2 | 12 | Z | 500 | 14 | 0 | 15.5 | 19.0 | -11.1 |
| S6LA | 00 | Z | 500 | 1 | 0 | 0.0 | 22.0 | 22.0 |
| S6LA | 12 | Z | 500 | 1 | 0 | 0.0 | 33.0 | 33.0 |
| ZCBP6 | 00 | Z | 500 | 5 | 0 | 23.4 | 37.4 | 29.2 |
| ZCBP6 | 12 | Z | 500 | 5 | 0 | 31.2 | 31.6 | -5.2 |
| 03953 | 00 | Z | 500 | 28 | 0 | 11.1 | 22.5 | 19.6 |
| 03953 | 12 | Z | 500 | 29 | 0 | 13.0 | 23.2 | 19.1 |
| 04018 | 00 | Z | 500 | 26 | 0 | 28.1 | 32.9 | 17.2 |
| 04018 | 12 | Z | 500 | 28 | 0 | 11.8 | 11.9 | -1.0 |
| 04220 | 00 | Z | 500 | 25 | 0 | 12.3 | 13.6 | 5.8 |
| 04220 | 12 | Z | 500 | 29 | 0 | 10.9 | 11.0 | -1.3 |
| 04270 | 00 | Z | 500 | 27 | 0 | 20.9 | 22.8 | 9.1 |
| 04270 | 12 | Z | 500 | 27 | 0 | 13.0 | 13.3 | 2.7 |
| 04339 | 00 | Z | 500 | 27 | 0 | 13.1 | 18.4 | 12.9 |
| 04339 | 12 | Z | 500 | 29 | 0 | 12.4 | 12.8 | 3.2 |
| 04360 | 00 | Z | 500 | 28 | 0 | 25.3 | 25.3 | 0.1 |
| 04360 | 12 | Z | 500 | 29 | 0 | 12.7 | 13.5 | -4.7 |
| 08001 | 00 | Z | 500 | 27 | 0 | 10.2 | 13.6 | 9.0 |
| 08001 | 12 | Z | 500 | 27 | 1 | 11.3 | 11.3 | 0.0 |
| 08508 | 00 | Z | 500 | 28 | 0 | 7.6 | 9.2 | 5.1 |
| 08508 | 12 | Z | 500 | 29 | 0 | 9.0 | 15.4 | 12.5 |
| 08522 | 12 | Z | 500 | 28 | 0 | 9.3 | 17.6 | 14.9 |
| 08594 | 12 | Z | 500 | 23 | 0 | 8.2 | 12.9 | 10.0 |
| 60020 | 00 | Z | 500 | 28 | 0 | 13.0 | 16.5 | 10.1 |
| 60020 | 12 | Z | 500 | 27 | 0 | 14.9 | 19.5 | 12.5 |
| 71600 | 00 | Z | 500 | 28 | 0 | 14.5 | 14.6 | 1.4 |
| 71600 | 12 | Z | 500 | 28 | 0 | 13.2 | 13.2 | 0.6 |
| 72201 | 00 | Z | 500 | 28 | 0 | 8.2 | 8.5 | 2.3 |
| 72201 | 12 | Z | 500 | 28 | 0 | 7.1 | 7.3 | -1.7 |
| 72402 | 00 | Z | 500 | 28 | 0 | 10.7 | 12.8 | 7.1 |
| 72402 | 12 | Z | 500 | 28 | 0 | 7.6 | 8.9 | 4.8 |
| 74494 | 00 | Z | 500 | 27 | 0 | 7.8 | 9.2 | 4.7 |
| 74494 | 12 | Z | 500 | 29 | 0 | 8.9 | 9.6 | -3.5 |
| 78016 | 12 | Z | 500 | 26 | 0 | 18.4 | 24.8 | 16.5 |

# TABLE 12

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from selected radiosonde TEMPs. |
| **Area monitored** | | :0°N - 90°N, 100°W - 40°E |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 12 UTC. |
| **Level monitored** | | :100 hPa. |
| **Element monitored** | | :VECTOR WIND in m $s^{-1}$ |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :UBIAS,VBIAS | :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |

**GROSS ERROR LIMITS** :Defined in Appendix I.2

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | % REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| ELML7 | 00 | V | 100 | 8 | 0 | 0 | 3.6 | 0.5 | 2.1 |
| ELML7 | 12 | V | 100 | 10 | 0 | 0 | 6.1 | 2.1 | 0.2 |
| FNOR | 00 | V | 100 | 9 | 0 | 0 | 5.9 | 1.9 | -1.3 |
| FNOR | 12 | V | 100 | 12 | 0 | 0 | 5.3 | 0.8 | -1.0 |
| FNOU | 00 | V | 100 | 13 | 0 | 0 | 5.8 | 1.9 | -2.5 |
| FNOU | 12 | V | 100 | 9 | 0 | 0 | 4.0 | -0.2 | -0.1 |
| FNPH | 00 | V | 100 | 9 | 0 | 0 | 3.8 | 1.5 | 0.4 |
| FNPH | 12 | V | 100 | 9 | 0 | 0 | 4.4 | 2.4 | -0.6 |
| FNRS | 00 | V | 100 | 11 | 0 | 0 | 4.8 | -0.1 | 0.7 |
| FNRS | 12 | V | 100 | 7 | 0 | 0 | 4.7 | -0.6 | -0.3 |
| LDWR | 00 | V | 100 | 26 | 0 | 0 | 4.0 | 0.5 | 0.2 |
| LDWR | 12 | V | 100 | 25 | 0 | 0 | 3.7 | -0.3 | -1.0 |
| OVYA2 | 00 | V | 100 | 13 | 0 | 0 | 4.3 | 1.4 | -0.4 |
| OVYA2 | 12 | V | 100 | 11 | 0 | 0 | 2.4 | 1.3 | 0.0 |
| OXTS2 | 00 | V | 100 | 11 | 0 | 0 | 4.3 | -0.5 | 1.6 |
| OXTS2 | 12 | V | 100 | 5 | 0 | 0 | 4.0 | 1.4 | -0.4 |
| ZCBP6 | 00 | V | 100 | 4 | 0 | 0 | 4.0 | -0.8 | -0.4 |
| ZCBP6 | 12 | V | 100 | 4 | 0 | 0 | 5.1 | 1.6 | -3.7 |
| 03953 | 00 | V | 100 | 27 | 0 | 0 | 4.4 | 0.8 | -1.5 |
| 03953 | 12 | V | 100 | 29 | 0 | 0 | 3.9 | -0.5 | -0.2 |
| 04018 | 00 | V | 100 | 22 | 0 | 0 | 5.3 | 0.7 | -0.7 |
| 04018 | 12 | V | 100 | 26 | 0 | 0 | 4.4 | 0.0 | -1.2 |
| 04220 | 00 | V | 100 | 21 | 0 | 0 | 4.4 | 0.4 | 0.6 |
| 04220 | 12 | V | 100 | 23 | 0 | 0 | 3.5 | -0.4 | 0.0 |
| 04270 | 00 | V | 100 | 23 | 0 | 0 | 4.0 | 1.4 | 0.6 |
| 04270 | 12 | V | 100 | 23 | 0 | 0 | 4.6 | 0.8 | 0.9 |
| 04339 | 00 | V | 100 | 23 | 0 | 4 | 7.7 | -1.3 | -1.3 |
| 04339 | 12 | V | 100 | 26 | 0 | 3 | 5.1 | 1.7 | -1.0 |
| 04360 | 00 | V | 100 | 26 | 0 | 0 | 5.0 | -0.1 | -0.4 |
| 04360 | 12 | V | 100 | 28 | 0 | 0 | 3.0 | -0.2 | -0.2 |
| 08001 | 00 | V | 100 | 27 | 0 | 0 | 4.9 | 1.0 | 0.2 |
| 08001 | 12 | V | 100 | 27 | 0 | 0 | 4.2 | 0.2 | -0.2 |
| 08508 | 00 | V | 100 | 17 | 0 | 0 | 5.1 | 0.5 | 1.3 |
| 08508 | 12 | V | 100 | 19 | 0 | 0 | 4.7 | 0.1 | -0.1 |
| 08522 | 12 | V | 100 | 28 | 0 | 0 | 5.9 | 1.1 | 1.1 |
| 08594 | 12 | V | 100 | 23 | 0 | 100 | 8.0 | -2.4 | 5.0 |
| 71600 | 00 | V | 100 | 29 | 0 | 0 | 4.0 | -0.1 | 0.2 |
| 71600 | 12 | V | 100 | 27 | 0 | 0 | 4.4 | 0.5 | 0.9 |
| 72201 | 00 | V | 100 | 28 | 0 | 0 | 4.3 | -0.3 | -0.1 |
| 72201 | 12 | V | 100 | 27 | 0 | 0 | 4.9 | 0.1 | 0.6 |
| 72402 | 00 | V | 100 | 27 | 0 | 0 | 5.0 | 1.1 | 1.7 |
| 72402 | 12 | V | 100 | 26 | 0 | 0 | 4.2 | 1.4 | 1.1 |
| 74494 | 00 | V | 100 | 17 | 0 | 0 | 4.3 | 0.5 | 1.2 |
| 74494 | 12 | V | 100 | 25 | 0 | 0 | 5.1 | -1.1 | 2.0 |
| 78016 | 12 | V | 100 | 26 | 0 | 0 | 5.5 | 1.6 | 0.4 |

## TABLE 13

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: FEBRUARY 2000

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from selected radiosonde TEMPs. |
| **Area monitored** | | :0°N - 90°N, 100°W - 40°E |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 12 UTC. |
| **Level monitored** | | :500 hPa. |
| **Element monitored** | | :VECTOR WIND in m $s^{-1}$ |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :UBIAS,VBIAS: | Mean difference of observations of U and V components from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |

| | |
|---|---|
| **GROSS ERROR LIMITS** | :Defined in Appendix I.2 |

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | % REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| ELML7 | 00 | V | 500 | 16 | 0 | 0 | 3.2 | 0.2 | 0.0 |
| ELML7 | 12 | V | 500 | 15 | 0 | 0 | 4.4 | 0.7 | -0.7 |
| FNOR | 00 | V | 500 | 11 | 0 | 0 | 3.1 | 0.7 | 0.2 |
| FNOR | 12 | V | 500 | 12 | 0 | 0 | 4.5 | -0.4 | -0.2 |
| FNOU | 00 | V | 500 | 14 | 0 | 0 | 3.6 | -1.9 | 0.5 |
| FNOU | 12 | V | 500 | 11 | 0 | 0 | 3.9 | -2.1 | 0.2 |
| FNPH | 00 | V | 500 | 10 | 0 | 0 | 4.2 | -0.8 | 2.5 |
| FNPH | 12 | V | 500 | 10 | 0 | 0 | 3.9 | 0.2 | -1.9 |
| FNRS | 00 | V | 500 | 14 | 0 | 0 | 4.7 | 0.9 | -0.2 |
| FNRS | 12 | V | 500 | 7 | 0 | 0 | 4.4 | -0.4 | -0.3 |
| LDWR | 00 | V | 500 | 28 | 0 | 0 | 5.5 | -0.3 | -1.2 |
| LDWR | 12 | V | 500 | 24 | 0 | 0 | 5.6 | -0.2 | -0.5 |
| OVYA2 | 00 | V | 500 | 13 | 0 | 0 | 6.8 | -1.2 | -1.6 |
| OVYA2 | 12 | V | 500 | 14 | 0 | 0 | 5.7 | 0.1 | -2.9 |
| OXTS2 | 00 | V | 500 | 15 | 0 | 0 | 5.9 | -1.2 | -0.9 |
| OXTS2 | 12 | V | 500 | 14 | 0 | 0 | 6.3 | -0.2 | 2.6 |
| S6LA | 00 | V | 500 | 2 | 0 | 0 | 3.5 | 2.1 | 2.3 |
| ZCBP6 | 00 | V | 500 | 4 | 0 | 0 | 2.5 | 1.0 | -0.2 |
| ZCBP6 | 12 | V | 500 | 4 | 0 | 0 | 5.4 | -1.1 | -2.2 |
| 03953 | 00 | V | 500 | 29 | 0 | 0 | 5.4 | 0.1 | -0.5 |
| 03953 | 12 | V | 500 | 29 | 0 | 0 | 5.3 | -0.1 | 1.4 |
| 04018 | 00 | V | 500 | 27 | 0 | 3 | 8.5 | -1.5 | 0.8 |
| 04018 | 12 | V | 500 | 28 | 0 | 0 | 5.5 | 0.2 | -1.2 |
| 04220 | 00 | V | 500 | 22 | 0 | 4 | 6.9 | -0.8 | -1.4 |
| 04220 | 12 | V | 500 | 21 | 0 | 0 | 4.8 | -0.5 | -1.1 |
| 04270 | 00 | V | 500 | 26 | 0 | 0 | 5.5 | -1.1 | 0.3 |
| 04270 | 12 | V | 500 | 27 | 0 | 7 | 8.2 | 1.4 | 0.3 |
| 04339 | 00 | V | 500 | 26 | 0 | 3 | 7.8 | -0.7 | 0.7 |
| 04339 | 12 | V | 500 | 28 | 0 | 0 | 7.6 | -0.5 | -1.7 |
| 04360 | 00 | V | 500 | 29 | 0 | 0 | 5.8 | 0.0 | -0.5 |
| 04360 | 12 | V | 500 | 29 | 0 | 0 | 5.8 | 0.3 | 0.5 |
| 08001 | 00 | V | 500 | 28 | 0 | 0 | 4.0 | 0.8 | 0.6 |
| 08001 | 12 | V | 500 | 28 | 0 | 0 | 4.1 | -0.3 | -0.7 |
| 08508 | 00 | V | 500 | 19 | 0 | 0 | 4.9 | 0.0 | -0.8 |
| 08508 | 12 | V | 500 | 19 | 0 | 0 | 4.1 | 0.3 | -1.1 |
| 08522 | 12 | V | 500 | 27 | 0 | 3 | 5.1 | 0.7 | -0.4 |
| 08594 | 12 | V | 500 | 25 | 0 | 100 | 7.2 | -0.3 | 0.9 |
| 60020 | 00 | V | 500 | 27 | 0 | 0 | 4.8 | 0.3 | 1.0 |
| 60020 | 12 | V | 500 | 25 | 0 | 0 | 5.5 | 0.5 | 0.6 |
| 71600 | 00 | V | 500 | 29 | 0 | 0 | 5.6 | 1.0 | 0.0 |
| 71600 | 12 | V | 500 | 28 | 0 | 0 | 6.1 | 1.4 | 1.6 |
| 72201 | 00 | V | 500 | 29 | 0 | 0 | 3.4 | 0.2 | 0.2 |
| 72201 | 12 | V | 500 | 28 | 0 | 0 | 3.8 | 0.3 | -0.4 |
| 72402 | 00 | V | 500 | 28 | 0 | 0 | 3.4 | 0.6 | 0.0 |
| 72402 | 12 | V | 500 | 26 | 0 | 0 | 3.8 | 0.1 | -0.6 |
| 74494 | 00 | V | 500 | 28 | 0 | 0 | 4.3 | -1.4 | 0.3 |
| 74494 | 12 | V | 500 | 29 | 0 | 0 | 3.8 | -0.4 | 0.4 |
| 78016 | 12 | V | 500 | 26 | 0 | 0 | 4.2 | 0.9 | -0.4 |

# APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

| Level (hPa) | Geopotential height (metres) |
|---|---|
| 1000 | 100 |
| 850 | 100 |
| 700 | 100 |
| 500 | 150 |
| 400 | 175 |
| 300 | 200 |
| 250 | 225 |
| 200 | 250 |
| 150 | 275 |
| 100 | 300 |
| 70 | 375 |
| 50 | 400 |
| 30 | 450 |

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

| Level (hPa) | Weight |
|---|---|
| 1000 | 3.70 |
| 850 | 3.40 |
| 700 | 2.90 |
| 500 | 2.20 |
| 400 | 1.90 |
| 300 | 1.60 |
| 250 | 1.50 |
| 200 | 1.37 |
| 150 | 1.19 |
| 100 | 1.00 |
| 70 | 0.87 |
| 50 | 0.80 |
| 30 | 0.64 |

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

| Level (hPa) | Windspeed m $s^{-1}$ |
|---|---|
| 1000 | 35 |
| 850 | 35 |
| 700 | 40 |
| 500 | 45 |
| 400 | 50 |
| 300 | 60 |
| 250 | 60 |
| 200 | 50 |
| 150 | 50 |
| 100 | 45 |